

ANTIMICROBIAL ACTIVITY AND PRELIMINARY PHYTOCHEMICAL SCREENING OF
FLOWER EXTRACTS FROM *AZIMA TETRACANTHA* (L.)Ravindran Jaganthan¹, Rajeswari Nagarajan², Bharathi Vadivel^{3&4}¹Lecturer, Faculty of Medicine, University Kuala Lumpur Royal College of Medicine Perak, Malaysia²Senior Research Fellow, Medical Biochemistry, Dr. A.L.M.P-G. Institute of Basic Medical Sciences, University of Madras, Chennai-113. Tamilnadu, India.³Ph.D Scholar in Biochemistry, Bharathiyar university, Coimbatore, Tamilnadu.⁴Shrimathi Indira Gandhi College, Trichy.

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ABSTRACT

In the present study aqueous, ethanolic and methanolic extract of *Azima tetracantha* were investigated for antimicrobial activity. The microorganisms employed were *Klebsiella sp.*, *Staphylococcus aureus* and *Pseudomonas aeruginosa. sp.* The susceptibility of bacteria strains against the three extracts was determined using the well diffusion method. The most susceptible micro organisms was *Staphylococcus aureus* while the least susceptible was *Klebsiella sp.* Highest antibacterial activity was observed with water extract of *Azima tetracantha* against *S. aureus* while minimum activity was observed with extract of *Azima tetracantha* against *Klebsiella sp.* Phytochemical analyses revealed the presence of alkaloid, tannin, Phenol, volatile oil, steroid, tannin and saponin.

KEYWORDS: *Azima tetracantha*, *Staphylococcus aureus* and *Pseudomonas aeruginosa. sp.***INTRODUCTION**

Medicinal plants, which form the backbone of traditional medicine, in the last few decades have been the subject for very intense pharmacological studies, this has been brought about by the acknowledgement of the value of medicinal plants as potential sources of new compounds of therapeutic value and as sources of lead compounds in drug development. In developing countries, it is estimated that about 80% of the population really depends on traditional medicine for their primary healthcare. There arises a need to screen medicinal plants for bioactive compounds as a basis for further pharmacological studies (Meléndez ET AL., 2006).

The *Azima tetracantha* (Salvadoraceae) is known as 'Esanku' in Malayalam, 'Mulsangu' in Tamil and 'Kundali' in Sanskrit, respectively. Its root, root bark and leaves are used with food as a remedy for rheumatism (Kritikar and Basu, 1984). It is a powerful diuretic given in rheumatism, dropsy, dyspepsia and chronic diarrhoea and as a stimulant tonic after confinement (Nadkarni, 1976). *Azima tetracantha* as efficient acute phase anti-inflammatory drug is traditionally used by Indian medical practitioners (Ismail et al., 1997). The plant is used to treat cough, phthisis, asthma, small pox and diarrhea. The decoction of the stem bark is considered astringent, expectorant and antiperiodic. The plant is diuretic, used in lithiasis. The root is demulcent, diuretic, useful in strangury (slow to be and painful discharge of

urine). The roots are used in the treatment of headache. The plant is regarded as a demulcent on the Malabar Coast. It is valued for cough in Ceylon; also as a vermifuge for children.

MATERIALS AND METHODS**Collection of Plant Material**

The healthy plant samples of *Azima tetracantha* (L) was collected from Trichy. The collected plant materials were transported to the laboratory. The identity of Plant was confirmed and authenticated at the Herbarium of the Department of Botany, St. Joseph College, Trichy.

Preparation of Leaf Powder

The *Azima tetracantha* (L) was collected, washed and cut into small pieces and dried at room temperature for two weeks and made in to powder for further analysis.

Extraction of Plant Material

Aqueous and alcoholic extracts were prepared according to the methodology of Indian pharmacopoeia. The shady dried plants materials were subjected to pulverization to get coarse powder. The coarse powder material was subjected to Soxhlet extraction separately and successively with alcohol and distilled water. These extracts were concentrated to dryness in flash evaporator under reduced pressure and controlled temperature (40-50°C).

Micro organisms and culture media

The bacterial cultures such as *Klebsiella sp.*, *Staphylococcus aureus* and *Pseudomonas aeruginosa. sp* were obtained from Doctor Diagnostic Center, Trichy.

The bacterial strains were maintained on nutrient agar medium. The antibacterial activity studied by agar well diffusion method.

Table 1: Antimicrobial activity of *Azima tetraacantha* against *Klebsiella sp.*

S.no	Name of the Plant Extract	Zone of Inhibition in mm		
		50µl	100µl	150µl
1	Ethanol	1.3	2.2	3.3
2	Methanol	1.6	2.5	3.8
3	Water	1.8	3.6	4.6

Table 2: Preliminary Phytochemical Result studies on *Azima tetraacantha* (L.).

PLANT EXTRACT	Phytocompound									
	A	T	Aq	C	T2	F	P	V	Q	S
Ethanol	+	-	-	-	-	-	+	-	-	+
Methanol	-	-	-	-	-	-	+	-	-	+
Water	+	-	-	+	+	+	+	-	-	-

A- T1-terpinoid: S-Steroid: C-Cumarin: T2-Tannin: F-Flavonoid: P-Phenolic Compound: V-Valotile oil: Q-Quinone: SSaponin, Aq: Anthroquinone.

Table 3: Antimicrobial activity of *Azima tetraacantha* against *Staphylococcus aureus*.

S.no	Name of the Plant Extract	Zone of Inhibition in mm		
		50µl	100µl	150µl
1	Ethanol	-	2.0	3.6
2	Methanol	1.6	2.2	3.2
3	Water	2.0	3.4	4.0

Table 4: Antimicrobial activity of *Azima tetraacantha* against *Pseudomonas aeruginosa*.

S.no	Name of the Plant Extract	Zone of Inhibition in mm		
		50µl	100µl	150µl
1	Ethanol	1.1	2.3	3.0
2	Methanol	1.8	2.6	3.5
3	Water	2.2	3.6	4.5

PRELIMINARY PHYTOCHEMICAL ANALYSIS

Table 1 represents the Phytochemical analysis of *Azima tetraacantha*. Phytochemical analysis were done in three different solvent such as ethanol, Methanol and water. The ethanolic extract revealed the presence of secondary metabolites such as alkaloids, saponins and phenolic compound. The Methanol extract of *Azima tetraacantha* contain saponins and phenolic compound. The aqueous extract contain Alkaloid, flavonoid, phenolic compound tannin and cumarin.

Various herbs and spices have been reported to exhibit antioxidant activity. A majority of the antioxidant activity is attributed to the flavones, isoflavones, flavonoids, anthocyanin, coumarin, lignans, catechins and isocatechins. Antioxidant based drug formulations are used for the prevention and treatment of complex diseases like atherosclerosis, stroke, diabetes, Alzheimer's disease and cancer (Khalaf et al., 2007).

Medicinal plants are of great importance to the health of individuals and communities. The medicinal value of these plants lies in some chemical substances that produce a definite physiological action on the human body. The most important of these bioactive constituents of plants are alkaloids, tannins, flavonoids, and phenolic compounds (Hill, 1952). Many of these indigenous medicinal plants are used as spices and food plants. They are also sometimes added to foods meant for pregnant and nursing mothers for medicinal purposes (Okwu, 1999, 2001).

ANTIMICROBIAL STUDIES

Table 2 indicate that the antimicrobial activity of *Azima tetraacantha* flower extract against *Klebsiella sp.* The maximum zone of inhibition (4.0mm) was observed in 150µl concentration against *Klebsiella sp* in water extract of *Azima tetraacantha*. The minimum inhibition zone (3.6mm) was observed in same concentration in ethanolic extract of *Azima tetraacantha*.

Table 3 indicate that the antimicrobial activity of *Azima tetraacantha* flower extract against *Staphylococcus aureus*. Among the three extract ,the aqueous extract of *Azima tetraacantha* have larger zone of inhibition (4.6) was observed at 150 µl concentration than compared to other concentration.The minimum inhibition zone was observed in 50 µl concentration (1.3mm).

Table 4 indicate that the antimicrobial activity of *Azima tetraacantha* flower extract against *Pseudomonas aeruginosa*.sp. Among the three extract, the methanolic extract of *Azima tetraacantha* have larger zone of inhibition (4.5) was observed at 150 µl concentration than compared to other concentration. The minimum inhibition zone was observed in 50 µl concentration (1.1mm).

SUMMARY AND CONCLUSION

The Present investigation carried out that Preliminary Phytochemical analysis were studied for aqueous, ethanolic and methanolic extract of *Azima tetraacantha*. The *Azima tetraacantha* (*L.*) contain more Phytochemical Such as alkaloid, tannin, Phenol, volatile oil, steroid, tannin and saponin. The present work demonstrates the antimicrobial potential of *Azima tetraacantha* (*L.*) flower extract by using various solvents. The results indicate that ethanol and methanol are better than water for the extraction of the antibacterial properties of *Azima tetraacantha* (*L.*). Highest antibacterial activity was observed with methanol extract of *Azima tetraacantha* against *S. aureus* while minimum activity was observed with aqueous extract of *Azima tetraacantha* against *Klebsiella sp.*

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