



PRELIMINARY PHYTOCHEMICAL AND DIURETIC POTENTIAL OF METHANOLIC EXTRACT OF *AZIMA TETRA CAHNTHA LAM, LEAF*

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Abstract

Azima tetraacantha.L belongs to Salvadoraceae and known as Kundali in Ayurvedic medicine. It was traditionally used for its diuretic property. Various analytical parameters such as ash value, water soluble ash, and sulphated ash done for this study. Ethyl alcoholic extract of *Azima tetraacantha Lam* leaf were investigated diuretic activity. Its root, root bark, and leaves are administered with food as a remedy for rheumatism, stimulant, expectorant, antispasmodic and analgesic effects. Phytochemical studies reveal the presence of carbohydrates, alkaloids, flavonoids, saponins, and triterpens are also reported to be present in this plant. The diuretic activity of the extract was determined by Taylor and Topless. In this method 500mg/kg extract does not match with effect produced by the standard. But 750mg/kg body weight of the extract is almost equal to effect produced by the standard drug hydrochlorothiazide so the *Azima tetraacantha.L* leaf extract posses the diuretic activity.

Key words: Hydrochlorothiazide, Antispasmodic, *Azima tetraacantha*.

Introduction

Plant medicine is commonly used in the traditional treatment of some renal diseases, and many plants are reported to possess significant diuretic activity. The diuretic activity of a number of plants used in ethno medicine as diuretic agents has been confirmed in experimental animals. Medicinal plants can be important source of unknown chemical substance with potential therapeutic effects. Besides the world health organization has estimated that over 75% of the world population still relies on plant derived medicine¹.

The utilization of plants for medicinal purpose in India has been documented long a back in ancient literature become they are essential to human survival².

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There are many pharmacologically active crude drug and chemical agents isolated from plant sources. Now a day's physicians have turned their attention to ayurvedic, siddha and unani system of treatment in western countries to avoid problematical effect of synthetic drugs, though they are much more potent these implies that natural plants have comparative therapeutic value with fewer side effects. Nearly one tenth of the people in the world are suffering from oedema due to sodium and water retention, anti diuretics as a result of therapeutic in complaines. It is necessary to reach for new drugs from natural sources against these ailments.

In common a diuretic is any substance which increases urine and solute production. But to be therapeutically diuretics should increase the output of sodium, chloride as well as water .most diuretics share the same mechanical action, blockade sodium and chloride reabsorption, hydrochlorothiazide promotes urine production by blocking the reabsorption of sodium and chloride early segment of distal convoluted tubule³. Ethyl Alcoholic extract of *azima tetra cantha* leaf were

investigated diuretic activity. It is a unique folk medicinal that belongs to the family *Salvadoraceae*. Its root, root bark and leaves are administered with food as a remedy for rheumatism⁴. *Azima tetracantha* leaves possess stimulant, expectorant, antispasmodic and analgesic effects. Preliminary phytochemical screening of the extracts showed the presence of Alkaloids, Flavonoids, Triterpens, Carbohydrates and Glycosides. The present study was to evaluate the diuretic activity of the extracts of *azima tetracantha* using Wistar albino rats.^{5, 6}

Materials and Methods

Plant Material

About 2kg of the leaves was collected from Viragalur village of Trichy Dist, Tamilnadu, India.

Determination of Ash Value

Ash values are helpful in determining the quality and purity of the crude drugs in powder form. Procedure given in Ayurvedic pharmacopeia⁷. Procedure was adopted to determine the different ash values such as total ash, acid insoluble ash, water soluble ash, sulphated ash and result shown in table 01.

Preparation Extracts

The leaves of *Azima tetracantha lam* were dried under shade; dried leaves were powdered to get a coarse powder. About 100gm of powdered leaves was evenly packed in a Soxhlet apparatus and extracted with ethanol by continuous hot percolation method. It was carried out for 72 hours. The ethanolic extract was concentrated to dry mass. After complete dryness the extracted material was weighed and the extractive value was calculated with reference to the air dried powdered drug.⁸

Drug Used

Hydrochlorothiazide was used as reference standard for the study of diuretic activity.

Experimental Animals

Wistar albino rats (male) obtained from Swamy Vivekananda College of Pharmacy, Elayampalayam, T.Code, Namakkal. 889/AE/05/CPCSEA-(Dt) 29th April 2011. Weighing 180-230gm were used for the experiment. The animals were kept in clean and dry

plastic cages, at $26 \pm 2^\circ\text{C}$ and relative humidity 45-55% light and dark cycle of 12 and 12 h respectively for 1 week. Animals were fasted and deprived of water for 18 hrs.

Qualitative Phytochemical Analysis

Phytochemical tests were carried out to find out the presence of phyto constituents viz, alkaloids, steroids, carbohydrates, fixed oils, fats, tannins, phenolic compounds, amino acids etc, and the results shown in Table 02.

Diuretic Activity

The method of Taylor and Topless (1962) were employed for assessment of diuretic activity on four male albino rats in each group. Weighing 180-230gm were to be selected. These were fasted and deprived of water for 18 hours. Prior to the experiment on the day of the experiment all the animals were given normal saline 25ml/kg/body weight.⁹

Animals were grouped into 4, each having four rats.

Group I was taken as control which was given normal saline 25ml/kg.

Group II was administered hydrochlorothiazide 1mg/kg and normal saline (25ml/kg) and kept as standard.

Group III was administered *azima tetracantha.L* extract 500mg and saline 25ml/kg.

Group IV was administered *azima tetracantha.L* extract 750mg and normal saline 25ml/kg.

Immediately after administration of the drug the animals were placed in metabolic cage specially designed to separate urine and feces and kept at room temperature at $25 \pm 0.5^\circ\text{C}$, and the result shown in Table 03, 04, 05 & 06.

Result and Discussion

This dissertation submitted comprises of the study of pharmacognostical, preliminary phytochemical and diuretic studies.

Pharmacognostical Studies

The dried coarsely powdered leaves were subjected to hot continuous extraction with ethanol. The ethanol extract was subjected to qualitative chemical analysis to detect the constituents, which shows the presence of carbohydrates, glycosides, phyto sterols, alkaloids & saponins.

Table 01: Data Showing the Different Ash Value of Leaves of *Azima tetracantha* Lam.

S.No	Type of ash	Ash value in % w/w
1.	Total ash	7.32
2.	Acid insoluble ash	1.02
3.	Water soluble ash	6.98
4.	Sulphated ash	14.40

Table 02: Qualitative Chemical Tests for Phytoconstituents in *Azima tetracantha* Lam.

S.No	Test	Ethyl alcoholic extract
1.	Alkaloids	+
2.	Carbohydrates	+
3.	Triterpenoids	+
4.	Flavonoids	+
5.	Proteins	-
6.	Resins	-
7.	Tannins	+
8.	Gums & mucilage	-
9.	Volatile oils	-

Table 03: Diuretic Activity of Controlled Group.

S.No	Treatment	Dose	Urine volume (ml)	Mean \pm SD
1.	Normal saline	25ml/kg	2.2	
2.	Normal saline	25ml/kg	2.5	2.475 \pm 0.1031
3.	Normal saline	25ml/kg	2.7	
4.	Normal saline	25ml/kg	2.5	

Table 04: Diuretic Activity of Hydrochlor thiazide Treated Animal 1mg/kg.

S. No	Treatment	Dose	Urine volume (ml)	Mean \pm SD
1.	Normal saline + Hydrochlor thiazide	25ml/kg + 1mg/kg	3.8	
2.	Normal saline + Hydrochlor thiazide	25ml/kg + 1mg/kg	3.5	3.6 \pm 0.09129
3.	Normal saline + Hydrochlor thiazide	25ml/kg + 1mg/kg	3.4	
4.	Normal saline + Hydrochlor thiazide	25ml/kg + 1mg/kg	3.7	

P<0.001 when compare with control (significant)

Table 05: Diuretic Activity of Extract Treated in Animal 500mg/kg.

S. No	Treatment	Dose	Urine volume (ml)	Mean \pm SD
1.	Normal saline + Extract	25ml/kg + 500mg/kg	2.7	
2.	Normal saline + Extract	25ml/kg + 500mg/kg	2.8	2.7 \pm 0.04082
3.	Normal saline + Extract	25ml/kg + 500mg/kg	2.6	
4.	Normal saline + Extract	25ml/kg + 500mg/kg	2.7	

p>0.05 when compare with control (significant)

Table 06: Diuretic Activity of Extract Treated in Animal 750mg/kg.

S. No	Treatment	Dose	Urine volume (ml)	Mean \pm SD
1.	Normal saline + Extract	25ml/kg + 750mg/kg	3.2	
2.	Normal saline + Extract	25ml/kg + 750mg/kg	3.4	3.3 \pm 0.04082
3.	Normal saline + Extract	25ml/kg + 750mg/kg	3.3	
4.	Normal saline + Extract	25ml/kg + 750mg/kg	3.3	

P<0.001 when compare with control (significant),
p>0.05 when compare with control (non-significant).

Pharmacological Studies

The diuretic activity of the extract was determined by Taylor and Topless. In this method the 500mg/kg extracted dose not match with effect produced by the standard¹⁰. But 750mg/kg body weight of the extract is almost equal to effect produced by the standard drug hydrochlorthiazide so the *azima tetracantha* extract posses the diuretic effect shown in Table 03, 04, 05 & 06.

Conclusion

The plant *Azima tetracantha.L* belongs to the salvadoraceae family was taken up for present study. The macroscopical character, ash value was determined for the leaf powder of *azima tetracantha.L*. The preliminary phytochemical analysis of the leaf extract shows the presence of carbohydrates, glycosides, alkaloids, saponins. The pharmacological screening of ethanolic extract of *azima tetracantha.L*. Leaf shows the significant diuretic activity.

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