



Research Article

Preliminary Phytochemical Analysis of *Calotropis gigantea* R. Br Flowers

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ABSTRACT

Calotropis gigantea (*C.gigntea*) are widely used traditional medicinal plants to treat various ailments. It is an erect, perennial shrub luxuriantly thriving in wasteland. Plants are the richest sources of bioactive organic chemicals on earth. They are the store house of secondary metabolites such as alkaloids, terpenoids, steroids and flavonoids etc. Establishment of standards of the plant parts will assist in standardization for quality, purity and sample identification. In present study we carried out the determination of physical constant, preliminary phytochemical screening and TLC profiling of flower plant extracts of *C.gigntea*. This study could be useful to set some diagnostic indices for preparation of monograph, standardization as well as for confirming identify of plant.

Keywords: *Calotropis gigantea*, Phytochemical, Traditional medicine, Phytochemistry, Preliminary, Physical constant

1. INTRODUCTION

Calotropis gigantea is commonly known as 'madar' in Hindi, belonging to the family Asclepiadaceae, is a milky shrub up to 1-3m in height found throughout India^{1,2}. It is a xerophytic erect shrub, growing widely throughout the tropical and sub-tropical regions of Asia and Africa. This plant is popularly known because it produces large quantity of latex. Medicinal plants have no doubt remained the major sources of traditional medicine worldwide³. It is estimated that only one percent of 2,65,000 flowering plants on earth have been studied exhaustively for their chemical composition and potential against important medicinal value⁴. All the parts, viz, root, stem, leaf and flowers of *C. gigantea* are in common in indigenous system of medicine⁵. Various parts of this plant are reported to possess multiple therapeutic properties like antipyretic, analgesic, anticonvulsant, anxiolytic, sedative, wound healing, antidiabetic⁶. Chemical investigation of *C. gigantea* report isolation of different types of phytochemicals such as flavonoids, glycosides, triterpenoids, steroids etc⁷. Here an

attempt has been made to investigate the chemical present in the plant for curing various diseases.

2. MATERIAL AND METHODS

2.1 Plants material

The flowers of the plants *C. gigantea* were collected from the local area of District Vidisha M.P., India. It was authenticated by the botany department of the institute and a voucher specimen was preserved in the herbarium record in Pest Control and Ayurvedic Drug Research Laboratory, Vidisha (M.P.) for further reference. The flower was stored under the normal environmental condition and the macroscopic given in WHO guidelines⁸.

2.2 Morphological evaluation of flowers

Morphological studies such as shape, size, color, taste and odour of flowers were carried out.

2.3 Determination of physico-chemical constant

Physicochemical constant of the flowers of the flower such as the total ash, acid soluble ash, acid soluble ash, water soluble ash and loss on drying were calculated based upon standard

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procedures⁹. Extractive value (petroleum ether, chloroform, ethanol, and water), were determined according to the official methods of Ayurvedic Pharmacopoeia of India¹⁰.

2.4. Preparation of extract and its phytochemical evaluation

The extraction was performed according to the method given by Harborny¹¹. The barks of the plant were washed with water, shade dried and ground into powder by using pestle and mortar. The powder of the plant material was extracted in Soxhlet apparatus using different solvents of increasing polarity. The extraction was done for 48 hrs. duration and up to 8 cycles of extraction. The crude extracts were concentrated in a rotavapour below 40 °C. After that, the crude extracts were evaporated on a water bath to get dryness. The extracts obtained with solvents were weighed and their percentages were calculated as compared to the initial weight of the plant material to get the extractive values. The extracts were subjected to qualitative phytochemical investigation and thin layer chromatography for the preliminary identification of the phytoconstituents. TLC plates were first viewed in day light then in UV chamber before keeping in iodine chamber and R_f of all were noted. Different solvent systems were found to be effective to get maximum no. of spots for various extracts.

3. RESULTS AND DISCUSSION

The macroscopical study of the flower of *C. gigantean* was done. For the study, the flowers were kept in the natural environment. The flowers were found to be flower white or purple in color, crown shape, odour faint and bitter in taste (Table -1).

The values of the physical constant like ash, loss on drying were determined (Table-2). Extractive value was highest in water and alcohol indicating the possible of considerable amount of polar compound in flowers (Table-3). Preliminary qualitative phytochemical screening of the flower extracts revealed the presence of carbohydrate, saponins and tannin (Table-4). Chromatography is used for the separation and identification of various components and R_f values of developed spot of different extracts were calculated with colour (Table-5).

Table 1: Macroscopical Features of Flowers of *Calotropis gigantean*

S. No.	Characteristics	Observations
1	Colour	White or Purple
2	Odour	Faint
3	Taste	Bitter
4	Shape	Crown

Table 2: Values of the Physical Constant of *Calotropis gigantean*

S. No.	Parameters	Values of flowers
1	Weight of powder material	5.0gm
2	Weight of Ash	18.8%
3	Loss of weight after burning	81.2%
4	Water soluble ash	32%
5	Acid soluble ash	25%

Table 3: Percent extractive and colour successive extract of *Calotropis gigantean*

S. No.	Solvent	Extractive value	Colour of extracts under ordinary light	Colors of extracts under UV light
1	Pet. Ether	13.30%	Light green	Yellow
2	Chloroform	16.52%	Green	Brown
3	Ethanol	18.62%	Brown	Yellowish
4	Water	36.06%	Dark Brown	Brown

Table 4: Preliminary Phytochemical test of *Calotropis gigantean*

Phytochemical Constituents	Water extract	Ethanol extract	Petroleum ether extract	Benzen	n-hexane
Alkaloid	+	+	+	+	+
Glycoside	+	+	+	+	+
steroids	+	+	+	+	+
Flavonoids	+	+	+	+	+
Saponins	+	+	+	+	+
Tannins	+	+	+	+	+
Carbohydrates	+	+	+	-	+
Protein	-	-	+	-	+
Amino acids	+	+	+	+	+

+ Present, - Absent

Table 5: TLC Profile of *Calotropis gigantea* Flowers

Flower Extracts	Chromatography Solvent	No. of spots	R _f values	Visualizing agents
Water	n-butanol : H ₂ O: HOAC (4:1:1)	3	0.65	Light yellow
			0.74	Green
			0.80	Yellowish
Chloroform	n-butanol : MeCOEt :NH ₄ OH:H ₂ O (5:3:1:1)	3	0.49	Brown
			0.60	Dark brown
			0.75	Yellowish

4. CONCLUSION

The plant *C. gigantea* R.Br has been study to give detailed reports on preliminary phytochemical study made on it. These parameters were determined which gives valuable information. This will help for correct identification of this plant for the future reference.

The extracts of flowers were subjected to preliminary test and the results indicated the presence of alkaloids, flavonoids, glycoside, terpanoids and steroids in flower extracts.

The maximum number of phytoconstituents was found in water extract of the flowers using preliminary phytochemical study i.e. phytochemical test and TLC.

The extractive values indicate that plants materials (flower) contain phytochemical with batter solubility in water. The result from the ash value, acid soluble ash, and water soluble ash values suggested that the flower contains demonstrable quantity of inorganic salts and calcium oxalate. The study may be useful in respect to its identification, authentication and standardization.

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