



RESEARCH ARTICLE

Phytochemical Screening of *Calotropis Gigantea* (Madar) Seeds Extracts

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ABSTRACT

The present study was designed to analyze the various phytoconstituents present in different extracts of seeds of *Calotropis gigantea*. Extracts of seeds of *C. gigantea* were prepared in different solvents viz. methanol, chloroform, petroleum ether, di-ethyl ether and water. The screening was performed for alkaloids, anthraquinones, flavonoids, saponins, tannins, and glycosides. The color intensity or the precipitate formation was used as analytical responses to these tests. The phytochemical tests revealed the presence of alkaloids, glycosides, flavonoids, tannins, saponins, carbohydrates, fixed oils and fats.

KEYWORDS

Calotropis gigantea, alkaloids, flavonoids, tannins, glycosides.

INTRODUCTION

Herbal medicine represents one of the most important fields of traditional medicine. WHO recognized that medicinal plants played an important role in the health care of about 80% of the world population in developing countries and depend largely on traditional medicine.¹ It is estimated that about 75% of the 120 biologically active plant derived compounds, presently in the use worldwide, have been derived through follow up researches to verify the authenticity of the data from folk and ethno-medicinal uses. So, there is a great scope for new drug discoveries based on traditional plant uses.²⁻⁴ Phytochemical studies have attracted the attention of plant scientist due to development of new and sophisticated techniques.

Calotropis gigantea (Crown flower) is a species of *Calotropis* native to Cambodia, Indonesia, Malaysia, Philippines, Thailand, Sri Lanka, India and China.

It belongs to family to Asclepiadaceae or Milkweed family or Aak family which includes more than 280 genera and about 2,000 species of tropical herbs or shrubby climbers, rarely shrubs or trees. Most members of the family have milky juice, flowers with five united petals, pod like fruits, and, usually, tufted seeds. The silky-haired seeds are drawn out of their pods by the wind and are carried off. Traditionally it is used alone or with other medicines to treat common disease such as fever, rheumatism, indigestion, cough, cold, eczema, asthma, elephantiasis, nausea, vomiting and diarrhea. According to Ayurveda, dried whole plant is a good tonic, expectorant, depurative, and anthelmintic. The powdered root is used in asthma, bronchitis and dyspepsia.⁵⁻¹⁰

The latex of *Calotropis gigantea* contains cardiac glycosides, calotropin, uscharin, calotoxin and gigantol. The resinol portion consists mainly of two new alcohols- α and β -calotropeols in almost equal quantities and minor amounts of β -amyryl. Also mixture of tetracyclic triterpene, fatty acids, flavonoids,

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alkaloids, proteolytic enzyme calotropain, traces of sterols etc.¹¹⁻¹²

C. gigantea has been reported to contain proteases, 3'-methylbutanoates of amyryl, flavonol glycosides, calotropins, stigmasterol and sitosterols, cardenolides, and pregnanone.¹³

MATERIALS AND METHODS

Plant Collection, Preparation and Extraction

The fruits of the plant were collected in May, 2012 from the rural areas of District Bareilly. The seeds were separated from the core of fruits. The plant was identified and authenticated by Birbal Sahani Institute of Paleobotany, Lucknow, where specimen sample was deposited.

The seeds were air dried for 2-3 days and then pulverized so as to obtain fine powder, which was stored properly till the time of analysis.

The powdered *C. gigantea* seed material was extracted separately and exhaustively using methanol, chloroform, petroleum ether, di-ethyl ether and water by Soxhlet extraction method. The extracts were dried under reduced pressure and stored aseptically in a desiccator at room temperature until needed.

Phytochemical Screening

Phytochemical screening was carried out by using procedures described by Kokate (1991) and Harborne (1973). It is obvious that any study in pharmacognosy must embrace a

Table 1: Phytochemical Analysis of various seed extracts of *Calotropis gigantea*

Constituents	Tests	Methanolic Extract	Chloroform Extract	Di-ethyl ether extract	Pet. Ether extract	Aqueous extract
Carbohydrate	Molish's test	+	+	+	+	+
	Fehling's test	+	+	+	+	+
	Legal's test	+	+	+	+	+
Saponins	Foam Test	+	+	+	+	+
Phenolic Compounds and Tannins	FeCl ₃ Test	+	+	-	+	+
	NaCl Test	+	+	-	+	+
	Lead acetate test	+	+	-	+	+
Phytosterols	Liebermann Burcard Test	+	+	-	-	-
	Salkowaski Test	+	+	-	-	-
Alkaloids	Dragendroff's test	+	+	+	+	+
	Mayer's test	+	+	+	+	+
	Wagner's test	+	+	+	+	+
	Hager's test	+	+	+	+	+
Flavonoids	Aqueous NaOH test	+	+	+	+	+
	Conc. HCl test	+	+	-	-	-
	Shinoda's test	+	+	+	+	-
Glycosides	Born Trager's test	+	+	-	-	+
Gums and Resins	Ppt. with 90% alcohol	-	-	-	-	-
Waxes	Ppt. with alcoholic KOH	-	-	-	-	-
Fixed oil and Fats	Spot test	+	+	+	+	+
	Saponification test	+	+	+	+	+

Where + means present and - means absent.

through consideration of both primary and secondary metabolites derived as a result of biosynthetic pathway. Therefore, the plant material was subjected to preliminary phytochemical screening in order to detect plant constituents. As per procedure the drug was first subjected to extraction with organic solvents in the increasing order of their polarity. Taking the last drop from thimble on a watch glass and observing residue formation which ensures complete extraction by each solvent. It is also ensured that powdered material is completely dried and freed from traces of previous solvents. After which the extracts were subjected to qualitative chemical tests. All the prepared plant extracts were subjected to preliminary phytochemical screening for the presence of alkaloids, glycosides, saponins, carbohydrates, tannins and phenolic compounds.^{14, 15}

RESULTS AND DISCUSSION

The results confirm the presence of constituents which are known to exhibit medicinal as well as physiological activities³. The phytochemical characteristics of the seed extracts of *Calotropis gigantea* investigated are summarized in table-1. The results reveal the presence of medicinally active constituents like tannins, alkaloid and saponins in the seeds of *Calotropis gigantea*.

CONCLUSION

The investigation carried out by us led to certain findings about the phytochemical features which no doubt can be proved beneficial and serve as scientific background for further isolation steps to obtain the lead compound.

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