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## Research Article

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## *In-vitro* anthelmintic activity of Akanda (*Calotropis gigantea* L.) whole plant methanolic extract in Indian adult earthworm

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### ABSTRACT

From ancient time *Calotropis gigantean* has lots of beneficial effects already reported, but in this research work two different concentration of plant methanolic extracts showed remarkable anthelmintic activity against India earthworms *Pheretima posthuma*. The result was also compared by standard drug Albendazole and Carboxy Methyl Cellulose (CMC) as a control group. Here we also find out the phytochemical constituent of this plant.

**Keywords:** Anthelmintic activity, *Calotropis gigantean*, *Pheretima posthuma*, methanol extract, aqueous extract, phytochemical analysis.

### INTRODUCTION

Man has been suffering from different dreaded disease throughout the year. From ancient time numbers of medicinal plants are used to treat them. *Calotropis gigantea* (L.) is one of the most important medicinal plants which have lots of therapeutic activities [1]. Numbers of disease like piles, tumours, wounds, parasitic infections and dysentery are quire by root bark of this plant [2]. Different kinds of worms can create helminthiasis which may also burrow our internal organs. Helminthic infections spread from eggs or larvae of worms in contaminated foods and one of the most widespread infections in humans, affecting a huge population of the world. It create a lots of harmful health hazards. As per the reports of WHO most of the drugs used against these worms are synthetic and have a lot of side effect [3-6].

Now-a-days helminthiasis is tedious problems to us to overcome this problem we have to find out an alternative way in the form of traditional medicines have an effective anti-helminthic agents [7]. Generally people, particularly in tropical developing countries totally depends on herbal medicines because it provide a great value to rural people and may be of value to global society as a source of new drugs. Many plants are the potent sources of anthelmintic activity found from recent research investigation and their efficacy have been tested on the following plants including Piper sp, Ficus benghalensis, Alpinia nigra, etc have been tested for their anthelmintic efficacy [8].

The purpose of the present work was to investigate the phytochemical and anthelmintic activity of different extracts of akanda (*Calotropis gigantea* L.) leaves in Indian earthworm.

### MATERIALS AND METHODS

#### Plant material

Most of the villagers and tribal's used the *Calotropis gigantea* (Linn.) for their common diseases regularly. On that context we have chosen the material as experimental tools. It is collected in the month of October, 2018 from Purba Medinipur district (Latitude- 22°23'38" north, Longitude- 87°44'20" east, Altitude- 5.41 meters from mean sea level), West Bengal, India and it is available in any season of year.

#### Experimental worms

Different kinds of round worm parasites of human are very much alike or physiological and anatomical resemblance with *Pheretima posthuma*. Separate beaker was taken for different concentrations and placed two earth worms generally in equal size in each beaker.

Then carefully observed and noted the paralysis and death time of worms. The standard anthelmintic drug albendazole(20 mg/ml) was taken to compare the tested results.

**Preparation of extracts**

The leaves of *Calotropis gigantea* were dried under shade and crushed in an electric blender to form powder and subjected to Soxhlet extraction (Continuous hot extraction) by using methanol and water as solvent. The methanolic extracts of plant were conc<sup>d</sup> by rotary evaporator and checking for their anthelmintic activity.

**Administration of Albendazole**

Standard drug, Albendazole (20mg/ml) and 0.5% w/v of Carboxy Methyl Cellulose (CMC) was prepared during this study a compared it with the results of different concentration of methanol plant extract.

**Administration of extract**

The two different extracts in different concentration i.e. methanolic and aqueous (50,100mg/ml) were prepared. 0.5% w/v of CMC was prepared as a control. Albendazole was used as standard drug. Separate beaker was taken for different concentrations and placed two earth worms generally in equal size in each beaker <sup>[9]</sup>.

**Experimental design**

The anthelmintic activity was performed according to the method <sup>[10]</sup>. Different kinds of round worm parasites of human are very much alike or physiological and anatomical resemblance with *Pheretima posthuma*. Separate beaker was taken for different concentrations and placed two earth worms generally in equal size in each beaker. Then carefully observed and noted the paralysis and death time of worms. The standard anthelmintic drug albendazole(20 mg/ml) was taken to compare the tested results.

**Phytochemical Analysis of the Plant Extracts**

Phytochemical constitutes of *Calotropis gigantea* was carried out according to the method <sup>[11]</sup>.

**RESULTS AND DISCUSSION**

The data revealed that the methanol extract and aqueous extract of *Calotropis gigantean* showed very significant anthelmintic activity. Both are showed different paralysis and death time at similar concentrations. During this experiment standard drug albendazole are

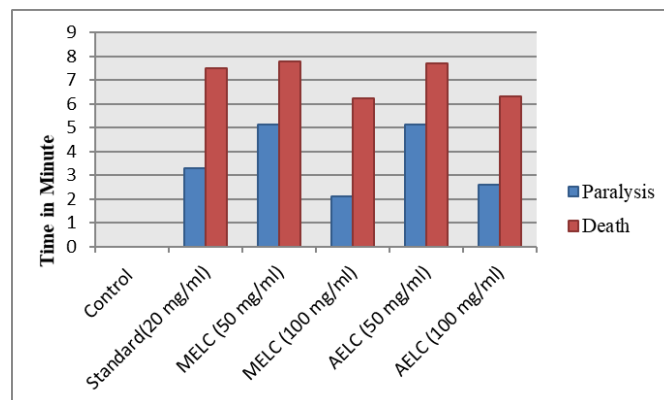
used to compare their results with test concentration. But this drug should have lots of serious side effects. Investigation of modern research clearly evaluates the activity of medicinal plant claimed for possessing the anthelmintic property. As expected control (0.5% CMC) does not

show any positive results. But standard drug (albendazole 20mg/ml), methanol and aqueous plant extract (50mg/ml and 100mg/ml) showed significant results of paralysis and death time of each worms. The potential anthelmintic activity showed in the Table 1, Figure 1 and Figure 2. Qualitative phytochemical analysis of different extracts of the plant was shown in the Table 2.

**Table 1:** Anthelmintic potency of methanolic and aqueous extract of *Calotropis gigantea*

Extract	Concentration (mg/ml)	<i>Pheretima posthuma</i>	
		Paralysis (P)	Death (D)
Control (0.5% CMC)	-	-	-
Standard (Albendazole)	20 mg/ml	3.28 ± 0.621	7.50 ± 0.215
Methanolic extract	50 mg/ml	5.14 ± 0.271	7.79 ± 0.271
	100 mg/ml	2.123 ± 0.162	6.25 ± 0.261
Aqueous extract	50 mg/ml	5.14 ± 0.562	7.70 ± 0.261
	100 mg/ml	2.61 ± 0.103	6.30 ± 0.312

All Values represent Mean ± SD; n=2 in each group. Comparisons made between standard versus treated groups, P<0.05 was considered significant



**Figure 1:** Anthelmintic activity of *Calotropis gigantean* leaves on *Pheretima posthuma*. MELC stands for methanolic extract, AELC stands for aqueous extract.



**Figure 2:** Anthelmintic activity of *Calotropis gigantean* leaves on *Pheretima posthuma* by A) Control B) Standard Albendazole C) different concentrations of methanolic extract D) different concentrations of aqueous extract.

**Table 2:** Preliminary phytochemical screening of *Calotropis gigantean*

S. No.	Phytochemical test	Petroleum ether extract	Methanol extract	Aqueous extract
1.	Test for alkaloid (Wagner's reagent)	+	+	+
2.	Test for carbohydrate (Molisch's reagent)	-	-	-
3.	Test for Glycolides	+	+	-
4.	Test for flavonoids	-	-	-
5.	Test for phenols	-	-	-
6.	Test for coumarins	-	+	+
7.	Test for tannins	-	-	-
8.	Test for saponins	-	+	+
9.	Test for Acid	-	-	-
10.	Test for Protein and amino acids	-	-	-
11.	Test for anthroquinone	+	+	+

+ = Positive, - = Negative

## CONCLUSION

After done all observation it may conclude that of *Calotropis gigantean* did produce very anthelmintic activity against India earthworms. During study this plant showed very significant anthelmintic activity at 100 mg/dl Con<sup>c</sup>. measured by time taken for paralyse / death of the earth worms. The result of different con<sup>c</sup> of methanolic extracts of plants can compared with the rules of standard drug, Albendazole and Carboxy Methyl Cellulose (CMC) acts as a control. Future details research work on this plant will open a new avenue of drug industries.

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## Conflict of Interest

Authors have no conflict of interest.

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