

Investigation of *In-vitro* Anthelmintic Activity of Aqueous and Ethanolic Extracts of Leaves and Seeds of *Guizotia abyssinica* (L.F.) Cass

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ABSTRACT: The aqueous and ethanolic extracts of *Guizotia abyssinica* (L.f.) Cass. were evaluated for anthelmintic activity using adult earthworms. The leaves and seed extract exhibited a dose-dependent inhibition of spontaneous motility (paralysis) and evoked responses to pin-prick. With lower doses the effects were comparable with that of albendazole. However, there was no final recovery in the case of worms treated with aqueous extract of seeds and ethanolic extract of leaves. The result showed that these extract possessed wormicidal activity and thus, may be useful as an anthelmintic agents.

Keywords: *Guizotia abyssinica*, Leaves, Seed, Anthelmintic activity

INTRODUCTION

Gastrointestinal parasites create a serious threat to the production of livestock in developing nations. Despite the fact of development of anthelmintic resistance in parasites of high economic significance, chemotherapy is still the most widely used option for the control of helminthes. Helminthes parasite infections are global problems with serious social and economic repercussions in the Third World countries. The diseases affect the health status of a large fraction of the human population as well as animals.

Some types of dangerous helminthes infections like filariasis have only a few therapeutic modalities at present. The continuous and long-term reliance on a small range of compounds has led to the development of drug resistance in many helminthic strains (Blakemore, 1999; Gunasekhararan et al., 2006). In addition, after treatment with albendazole or mebendazole, several side effects have been reported in hosts such as gastrointestinal symptoms (epigastric pain, diarrhea, nausea, vomiting), nervous system symptoms (headache, dizziness), and allergic phenomena (edema, rashes, urticaria). Some anthelmintic drugs, such as praziquantel and albendazole, are contraindicated for certain groups of patients like pregnant and lactating woman. These drugs have also to be used with caution in hepatitis patients and in children below 2 years of age (Poojashree et al., 2011).

Keeping all these aspects in mind the search of natural anthelmintic is essential. The plant *Guizotia abyssinica* (L.f.) Cass., (Niger/Ramtil), family Asterace is an indigenous and oil yielding plant grown under cultivation in some parts of our country and was chosen for the present investigation. The scanty availability of information on this plant facilitates the study on it.

METHODS AND MATERIALS

Selection, collection and authentication of plant/plant material:

The seeds of the selected plant were collected in the months of July 2011 from the Jawahar Lal Nehru Krishi Vishwavidyalay (JNKVV) Agriculture University, Jabalpur, M.P. and identified & authenticated by Dr. (Mrs.) Neeta Singh, Prof. and Head, Department of Botany, Govt. Girls PG College, A.P.S. University, Rewa, M.P. and was deposited in our Laboratory, Voucher specimen No. PCog/GA/0914. The seeds were then sown in soil, irrigated regularly and after 3-4 months leaves was collected, dried under shade, powdered and stored in an air-tight container for further use.

Selection and Collection of Earthworm:

For the anthelmintic activity, Indian adult earthworms (*Pheretima posthuma*) 6 cm in length and 0.1-0.1-2 cm in width were used. The earthworms were collected from College of Agriculture, RVSKVV, Indore, (M.P.) due to their anatomical and physiological resemblance with the intestinal roundworm parasites of human being – from moist soil and washed out of sand.

Sample Preparation:

100 mg of extract was weighed accurately and was dissolved in 1% gum acacia in normal saline. The concentration of stock solution is 1000 µg/ml. From the above stock solution 10, 7.5, 5 and 2.5 ml were dissolved in 100 ml separately to produce 100, 75, 50 and 25 µg/ml.

Standard Preparation:

100 mg of standard drug (Albendazole) was weighed accurately and was dissolved in 1% gum acacia in normal saline. The concentration of stock solution is 1000 µg/ml. From the above stock solution 10, 7.5, 5 and

2.5 ml were dissolved in 100 ml separately to produce 100, 75, 50 and 25 µg/ml.

Anthelmintic Investigation:

The earthworms were divided in 6 groups X 4 of six earthworms in each group having uniform size. Group I was control and treated with distilled water, Group II served as standard drug albendazole while Group III to VI was treated with different concentrations of aqueous and ethanolic extract of *Guizotia abyssinica*. Observation were made for time taken to paralyze, paralysis was said to occur when earthworms did not revive in normal saline and shows no motility and death, death was concluded

when earthworms lost their motility and followed with their body colors fading away (Poojashree et al., 2011; Dwivedi et al., 2008).

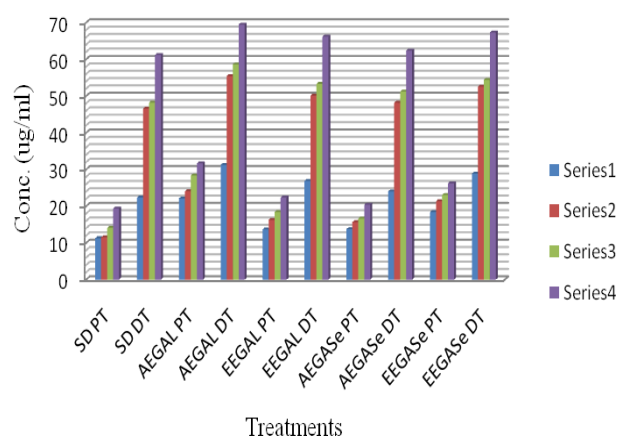
RESULTS

The attempt was made to study *in vitro* anthelmintic activity of aqueous extract and ethanolic extract of leaves and seeds. The anthelmintic activities of the extract were determined and it was found that AAGASe possesses higher activity than other extract and found to be significant when compared with the standard drug (Table 1 and Graph 1).

Table 1. Comparison between standard drug and *Guizotia abyssinica* (L.f.) Cass. extract for Anthelmintic activity

S/No.	Treatment	Concentration (µg/ml)	Paralysis Time (Min)	Death Time (Min)
1.	C	-	-	-
2.	SD	100	11.29±0.22	22.38±0.33
		75	11.54±0.13	46.56±0.33
		50	14.10±0.22	48.20±0.13
		25	19.38±0.16	61.17±0.30
3.	AEGAL	100	22.12±0.30*	31.26±0.31*
		75	24.05±0.12*	55.43±0.17*
		50	28.37±0.23*	58.62±0.19*
		25	31.65±0.39*	69.45±0.19*
4.	EEGAL	100	13.66±0.20*	26.89±0.27*
		75	16.30±0.26*	50.11±0.27*
		50	18.40±0.18*	53.32±0.28*
		25	22.36±0.18*	66.18±0.12*
5.	AEGASe	100	13.73±0.20*	24.01±0.14*
		75	15.66±0.29*	48.16±0.18*
		50	16.63±0.26*	51.22±0.11*
		25	20.40±0.19*	62.38±0.19*
6.	EEGASe	100	18.40±0.36*	28.86±0.29*
		75	21.33±0.28*	52.55±0.20*
		50	23.03±0.13*	54.42±0.19*
		25	26.22±0.17*	67.32±0.30*

Values are expressed as X (Mean) +SEM, n=6. (One way ANOVA followed by Student t-test). Statistically significance of *P<0.001 in comparison to standard. Abbr: C=Control (Water only), SD=Standard drug (Albendazole), AEGAL = Aqueous extract of *Guizotia abyssinica* Leaves, EEGAL= Ethanolic extract of *Guizotia abyssinica* Leaves, AEGASe = Aqueous extract of *Guizotia abyssinica* Seed, EEGASe = Ethanolic extract of *Guizotia abyssinica* Seed



Graph 1: Showing Paralysis and death time as compared with standard. Abbr: SD=Standard drug (Albendazole), AEGAL = Aqueous extract of *Guizotia abyssinica* Leaves, EEGAL= Ethanolic extract of *Guizotia abyssinica* Leaves, AEGASe = Aqueous extract of *Guizotia abyssinica* Seed, EEGASe = Ethanolic extract of *Guizotia abyssinica* Seed, PT = Paralysis Time, DT = Death Time, Series 1= Conc. 100 µg/ml, Series 2= Conc. 75 µg/ml, Series 3= Conc. 50 µg/ml, Series 4= Conc. 25 µg/ml.

DISCUSSION

The plant *Guizotia abyssinica* (L.f.) Cass. Is an indigenous plants grown under cultivation in many parts of our country and was chosen for the present investigation. The plant belongs to the family Asterace. The scanty availability of information on this plant facilitates the study on it.

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