

IN- VITRO EVALUATION OF ANTHELMINTIC ACTIVITY OF *LASIA SPINOSA* LEAVES**DURAJAN GOSHWAMI^{1*}, MD. MOSTAFIZUR RAHMAN², MD. ABDUL MUHIT³, MD. SAIFUL ISLAM⁴**¹Department of Pharmacology, National Medical College & Teaching Hospital, Birgunj, Parsa, Nepal, ^{2,3,4}Department of Clinical Pharmacy & Pharmacology, Faculty of Pharmacy, University of Dhaka, Dhaka-1000, Bangladesh. Email: durajan22@gmail.com

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ABSTRACT

The present study was aimed to evaluate anthelmintic activity of methanolic extract of leaves of *Lasia spinosa* against *Pheretima posthuma*. Three different concentrations (25 mg/ml, 50 mg/ml and 100 mg/ml) of extracts were studied in this activity which involved determination of time of paralysis and time of death of worms. The results of present study indicated that methanolic extract significantly exhibited paralysis and also caused death of worms especially at highest concentration of 100 mg/ml, as compared to standard reference Albendazole (10 mg/ml). Our study found that the leaves of *Lasia spinosa* possess potent anthelmintic activity.

Keywords: *Lasia spinosa*, Anthelmintic, *Pheretima posthuma*, Albendazole**INTRODUCTION**

Lasia spinosa (Bengali name: Kankachhu, Family: Araceae) is a stout, intensely prickly marsh plant, with creeping rootstock found throughout the country in low-lying shady areas, near water bodies. The plant is recommended for colic, rheumatism and intestinal diseases. Corm is used as a remedy for throat affections. Leaves and corms are given as a cure for piles in Khagrachari [1]. The tuber of *Lasia spinosa* (L.) Thwaites are used for treatment of rheumatoid arthritis, constipation, and to purify blood in Rajshahi and Natore district of Bangladesh [2]. The young tender leaves of *L. spinosa* are used to treat intestinal worms' infections in folk medicine of Naga tribes of India [3]. *Lasia spinosa* rhizome possessed a wide-ranging antioxidant capacity [4], antimicrobial property and cytotoxic activities [5]. The leaves are used as anticestodal agent [6]. Previous investigations on crude root extract demonstrated antinociceptive, anti-inflammatory and anti-diarrhoeal activity [7].

A review of literature revealed that the anthelmintic activity of leaves of *L. spinosa* has not been subjected to scientific evaluation. So the present study was aimed to investigate the anthelmintic activity of leaves of *L. spinosa* with a view to justify its use in the treatment of helminthes.

MATERIALS AND METHODS**Collection of plant material and extraction**

L. spinosa leaves were collected from Sundarban area, Khulna, Bangladesh in May 2011. The plant was identified by an expert taxonomist and a specimen representing this collection has been deposited in the Dhaka University Herbarium, Dhaka (Accession No. DUSH 1940) for further reference. The leaves were shade dried and coarsely powdered. The dried and coarse powder (650 gm) was extracted with methanol (2.5 liters) in an air tight, clean flat-bottomed container for 15 days at room temperature with occasional stirring. The extract was then filtered through a fresh cotton plug followed by a Whatman No. 1 filter paper. The filtrate was concentrated using a rotary evaporator at low temperature (40-45°C) and pressure. The weight of the crude extract was 23 gm.

Phytochemical screening

The methanolic extract was subjected to preliminary phytochemical screening for the detection of major chemical groups [8,9].

The results of different chemical tests on the methanolic extract of the leaves of *Lasia spinosa* showed the presence of alkaloids, flavonoids, tannins and glycosides.

Selection of worm

The assay was performed on adult earthworm, *Pheretima posthuma* due to its anatomical and physiological resemblance to the human

intestinal round worm parasite [10,11]. Because of easy availability, earthworms have been widely used for the initial evaluation of anthelmintic compounds in vitro. Adult earthworms (*Pheretima posthuma*) were collected from moist soil of Savar area of Dhaka, Bangladesh and washed with normal saline to remove all fecal matters. Then the worms were used for anthelmintic study. The earthworms of 3-5 cm in lengths and 0.1-0.2 cm in width were used for all the experimental protocol.

Anthelmintic activity

The anthelmintic assay was carried out as reported earlier [12] with minor modifications. The methanolic extract was dissolved in minimum amount of DMF and the volume was adjusted to 50 ml with normal saline. All drugs and extract solutions were freshly prepared before starting the experiment. 50 ml formulations containing three different concentrations (25, 50 and 100 mg/ml in normal saline) were prepared and six worms were placed in it. Observations were made for the time taken for paralysis (paralysis was said to occur when no movement of any sort could be observed except when worm were shaken vigorously) and death (time for death of worms was recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C), followed with their body colors fading away). Albendazole (10 mg/ml) was used as reference standard while normal saline as the control.

STATISTICAL ANALYSIS

All values were expressed as the mean \pm standard error of the mean (SEM) and the results were analyzed statistically by one way analysis of variance (ANOVA) followed by Dunnett's test by using SPSS ver.17. P < 0.05 compared to standard was considered to be statistically significant.

RESULT AND DISCUSSION

The effect of methanolic extract of *Lasia spinosa* leaves at different conc.(mg/ml) to paralyze and cause death to earthworm to evaluate *in vitro* anthelmintic activity were observed as follows as shown in table 1.

It is evident that methanol extracts of *L. spinosa* exhibited anthelmintic activity in dose-dependent manner giving shortest time of paralysis and death with 100 mg/ml concentration. The methanol extract caused paralysis at 6.44 min and time of death at 8.32 min with 100 mg/ml against the earthworm *Pheretima posthuma*. The standard drug Albendazole at 10 mg/ml concentration showed the same at 4.29 and 6.49 minutes, respectively. This reveals that methanol extract of leaves of *Lasia spinosa* showed the best anthelmintic activity and supports the traditional use of leaves of this plant in various intestinal diseases in folk medicine.

The literature review reveals that tannins which are chemically polyphenolic compounds are responsible to produce anthelmintic activity [13-15]. As phytochemical analysis of the methanolic leaf extract of *Lasia spinosa* revealed the presence of the tannin among other chemical constituents, it is possible that

tannins contained in the extracts produced similar effects. The reported anthelmintic effect of tannins is that they can bind to free proteins in the gastrointestinal tract of host animal [16] or glycoprotein on the cuticle of the parasite [17] and may cause death.

Table 1: Results of *in-vitro* anthelmintic activity of methanolic extract of *Lasia spinosa*

Test sample	Conc.(mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
Methanolic extract	25	12.12 ± 0.379**	14.04 ± 0.498**
	50	10.39 ± 0.236**	11.59 ± 0.371**
	100	6.44 ± 0.251**	8.32 ± 0.299*
Albendazole	10	4.29 ± 0.213	6.49 ± 0.279
Control group	-	-	-

Values are expressed as Mean ± SEM (n=6). **P < 0.01, *P < 0.05 compared to standard (albendazole). Worms in control group were alive up to 24 hrs of observation.

CONCLUSION

The methanolic extract of the leaves of *Lasia spinosa* displayed profound anthelmintic activity in the study. But this study is preliminary type and it would be interesting to carry out further study for isolating the possible phytoconstituents and characterization of the active constituents which may be responsible for the observed anthelmintic activity.

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CONFLICT OF INTEREST

There are no conflicts of interest.

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