

In-Vitro Evaluation Of Anthelmintic Activity Of Aerial Parts Of *Euphorbia Hirta* On Earthworms: A Comparative Study

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ABSTRACT

Development of anthelmintic resistance and high cost of conventional anthelmintic drugs led to the evaluation of medicinal plants has an alternative source of anthelmintics. In the present study Aqueous & ethanolic extract of *Euphorbia hirta* Aerial Parts were screened for their anthelmintic activity. Aqueous and Ethanolic extracts of *Euphorbia hirta* Aerial Parts were taken for in vitro comparative studies on the anthelmintic activity against *Pheritimaposthuma*. Different concentrations (10, 20, 30, 40, 50 mg/ml) of extracts were used for the activity and results were expressed in terms of time for paralysis and time for death of worms. Albendazole concentrations (10 mg/ml) were used as a reference standard and normal saline (0.9% NaCl) was used for the control treatment.

Keywords: *Euphorbia hirta*, Anthelmintic Activity, *Pheritima Posthuma*, Albendazole.

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INTRODUCTION

In recent times the usage of anthelmintic drugs is inducing toxicity in both animals and human beings. On that account, this lead to the invention of new constituents that act as anthelmintics which are formulated through traditional ayurvedic medicinal plants leading to the development of new chemical substances and active substances without generating any adverse effects are considered to be the best source of bioactive substances. They are also known as vermicides or vermifuges[1]. The World Health Organization estimates that a staggering 2 billion people harbor parasitic worm infections. Parasitic worms also infect livestock and crops, affecting food production with a resultant economic impact. Also of importance is the infection of domestic pets. Indeed, the companion animal market is a major economic consideration for animal health companies undertaking drug discovery programmes. Anthelmintics are medications used to eradicate parasitic worms (helminthes) from the human body. Helminth infections are one of the most common infections, affecting a large proportion of the world mainly in tropical regions. In developing countries they pose a large threat to public health, and leading to malnutrition, anemia, eosinophilia (a higher than normal level of the white blood cell), and pneumonia. The worms that cause infection in man generally include the roundworms, the tapeworms and the flukes[2,3]. *Euphorbia hirta* Linn. is a small herb, belongs to family Euphorbiaceae, distributed throughout the tropical and subtropical part of India. The largest genus of family Euphorbiaceae is *Euphorbia* with about 1600 species. It is characterized by the presence of white milky latex which is more or less toxic[4]. The plant parts are widely used in traditional system of medicines. *Euphorbia hirta* Linn is a plant that grows up to 80 cm in height with slender and erect stem. It is a broad leaf with hairy stem with leaves that are oblong, elliptical, opposite arrangement. It has a faint toothed margin with small flowers. The plant is usually found in grasslands, pathways, roadsides, and in areas rich in water. The fruits are yellow in color with 1-2 mm in diameter that has wrinkled seeds along the four sides with hairy capsules[5].



Figure.1; *Euphorbia hirta* plant

MATERIALS AND METHODS

Collection and Identification of Plant

Aerial parts of *Euphorbia hirta* were collected within our college premises located in Azamgarh district. The plant and plant materials were identified and authenticated in Department of Botany.

Collection of Earthworms

The earthworm was used for evaluating the anthelmintic activity. The earthworms were collected from moist soil and washed with normal saline to remove all fecal matter. The earthworm *Pheretima posthuma* as it has anatomical and physiological resemblance with the intestinal roundworm parasites of human beings; used for anthelmintic activity.

Preparation of extract

The powdered aerial parts (100gm) of the plant was defatted with petroleum ether and extracted with Distilled water and ethanol solvent through Soxhlet extraction techniques at 40°C for about 24 hours. Extract was taken into a beaker and evaporated under reducing pressure to get dried residue. The percentage yields of the extracts were found to be 14% and the extract thus obtained was used for the anthelmintic study.

Standard used used

Albendazole in the concentration 10mg/ml was used as standard to compare the test result.

Screening for Anthelmintic Activity

The Anthelmintic activity of aerial parts of *Euphorbia hirta* has been evaluated by using method of Mali[6]. The activity has been evaluated on adult Indian earthworm. It was collected during rainy season the length of worm. Care was taken to provide normal leaving conditions necessary for the worms by placing them in normal saline. The Earthworms were divided into twelve groups containing three earthworms in each group. Aqueous and Ethanolic extracts of *Euphorbia hirta* were dissolved in normal saline to get 10, 20, 30, 40, 50mg/ml concentration. The Albendazole (10mg/ml) was used as standard, where normal saline solution used as control. Time taken for paralysis and death of worms were observed individually. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death of individual worm was recorded when worms showed no movement even after vigorous shaking or dipping in the warm water (40°C) followed by fading of their body colour[7,8].

Table 1: Anthelmintic Activity against Earthworm

Group	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
Control (Normal Saline)	-----	-----	-----
Standard (Albendazole)	20	26.37±0.48	54.26±0.17

Aqueous Extract	10	84.34+0.42	141.45+1.26
	20	73.54+1.39	117.29+0.38
	30	61.78+0.32	105.23+0.37
	40	59.78+0.15	85.78+1.35
	50	52.78+1.35	79.78+0.45
Ethanolic Extract	10	71.24+1.18	125.45+0.35
	20	63.78+0.54	98.55+0.24
	30	54.25+1.46	72.49+0.17
	40	48.25+0.67	64.25+0.46
	50	37.25+1.67	59.25+1.87

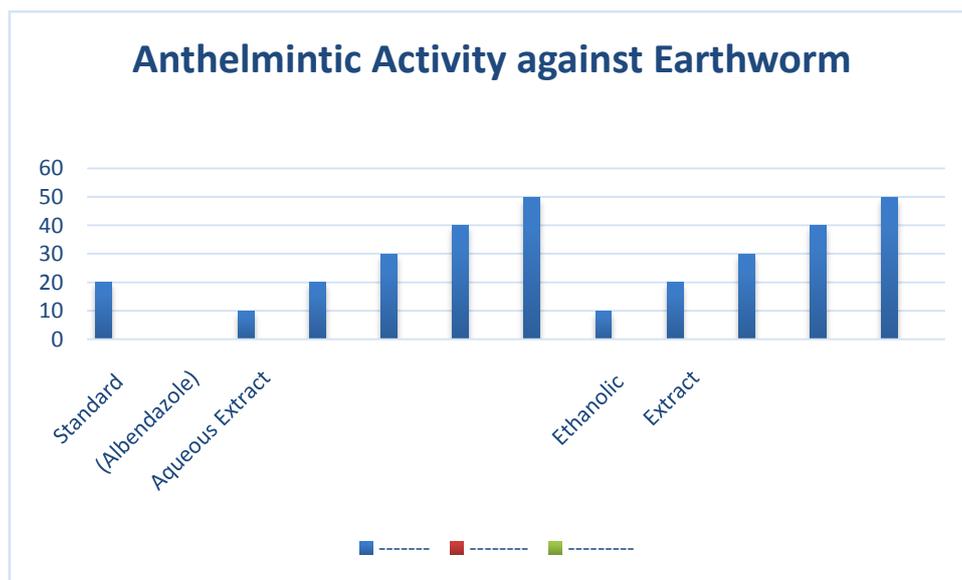


Figure.2: Anthelmintic Activity against Earthworm

RESULT AND DISCUSSION

The results in Table 1 show that the time taken for paralysis and death of worms after treating with test substance. The activity was comparable with standard drug Albendazole. Ethanolic and aqueous extracts both show significant Anthelmintic activity against earthworms. Ethanolic extract found to be more active as compared to Water extract. The Ethanolic extract demonstrated paralysis as well as death of worms in a comparative good time as compared to Albendazole especially at concentration of 20 mg/ml. While water extract also show significant activity.

CONCLUSION

In conclusion, the use of Aerial parts of *Euphorbia hirta* as an anthelmintic have been confirmed as the aerial parts extracts displayed activity against the worms used in the study. Further studies using in vivo model are required to find out anthelmintic activity and to isolate active constituent from the extract to establish mechanism of action are required.

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