

Phytochemical Screening and Anthelmintic Activity of Aerial Parts of Aqueous Methanolic Extract of *Euphorbiahirta* against Earth Worms

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ABSTRACT: The present study was aimed to investigate the anthelmintic activity of various extracts which were obtained from the *Euphorbiahirta* belonging to the family Euphorbiaceae, against earthworms (*Pheretimaposthuma*). Phytochemical screening is the inestimable step in the detection of bioactive principles present in the plant. It resulted in the detection of tannins and flavonoids. The experimental results showed that aqueous methanolic extract possess vermifuge and vermicide activity of the worms and it was found to be effective as anthelmintic. The anthelmintic activity of aqueous methanolic extracts of *Euphorbiahirta* has therefore been reported for the first time.

KEYWORDS: Earthworm, Extract, Screening, Anthelmintic activity. .

I. INTRODUCTION

Helminth infections are the most common wide spread infections which influence the large proportion of world population. In the treatment of parasitic diseases, the anthelmintic drugs are used promiscuously. 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⁾. Most of the helminth infections are mainly subjected to the people who live in the tropical regions. The existence of helminth infections are mainly due to their unhygienic lifestyle, poverty and malnutrition resulting in the development of symptoms like anaemia, eosinophilia and pneumonia⁽²⁾. The use of natural plant extracts as anthelmintics has an increasing demand in the endemic centuries. There are numerous advantages of natural plant extracts that make them attractive for use in developing countries- available in low cost, large amount of raw materials⁽³⁾.

Euphorbiahirta is a medicinal, rhizomatous herb distributed in Southern Ghats of India and Northern East coast of Tamilnadu which belongs to the family Euphorbiaceae⁽⁴⁾. The largest genus of family is about 1600 species. Individualized by the existence of white milky latex which is more or less toxic, it comprises of various medicinal properties like antibacterial, anthelmintic, anti-asthmatic, sedative, antispasmodic, antifertility, antifungal and antimalarial properties⁽⁵⁾. It is a plant which grows up to 80cm in height with willowy and erect stem. It has broad leaves with hairy stem and are elliptical an oblong. The plant is usually found roadsides, pathways and the areas which are rich in water. Fruits of plant are yellow in color with 1-2mm in diameter that has crimp seeds along the four sides with hairy capsules.⁽⁶⁾

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II. MATERIALS AND METHODS

PLANT COLLECTION AND AUTHENTICATION: Aerial parts of *Euphorbiahirta* were collected within our college premises located in Vizianagaram district also obtained from road side & waste lands located near the hills of Visakhapatnam. The plant and plant materials were identified and authenticated in Department of Botany, Andhra University by Professor S.P. Padal. Deposited in the botany department herbarium and the specimen herbarium number is given as 22333.

PREPARATION OF EXTRACT: Aerial parts of *Euphorbiahirta* were collected, washed thoroughly and dried under shade and then made into moderate powder using dry grinder. The extract was taken in a 1000ml round bottomed flask, to this distilled water and methanol were added in equal ratio. They were subjected to maceration process for about 2-3 days followed by soxhlation extraction process. Hydro distillation was carried out that was responsible for recollection of methanol from extract. Plant extracts were stored in sample bottles in a refrigerator for further studies.

PRELIMINARY PHYTOCHEMICAL INVESTIGATION: The phytochemical screening of *Euphorbiahirta* extracts revealed the presence of tannins and flavonoids.

WORMS COLLECTION AND AUTHENTICATION: Indian adult earthworms (*Pheretimaposthuma*) were collected from moist soil and washed with normal saline solution in order to remove the faecal matter.

ANTHELMINTIC ACTIVITY: The anthelmintic activity was carried out as per the method of V. Murugamani et.al with major modifications on Indian earthworm as it has physiological resemblance with the intestinal round worm parasites of human beings. All the drugs and extracts were prepared freshly before starting the experiment. Various concentrations (40, 50, 60, 70, 80, 90, 100mg/ml) of extract were tested by bioassay, which involves the determination of time of paralysis and death. Albendazole was used as standard reference and distilled water as control. The standard reference albendazole was taken in various concentrations of (20, 40mg/ml). *Pheretimaposthuma* was placed in petri dishes containing different concentrations of aqueous methanolic extract of *Euphorbiahirta* and are observed for paralysis & death. The time taken for paralysis was noted when there was no movement in worms except when shaken vigorously. Death was confirmed when worms lost their motility followed by fading of their body colours.

The results of anthelmintic activity are given in table 1

Table 1: Anthelmintic activity of aqueous methanolic extract of aerial parts of *Euphorbiahirta*

	Concentration(mg/ml)	Paralysis(min)	Death(min)
Standard (Albendazole)	20	27.51 ± 1.48	56.63 ± 3.23
	40	24.05 ± 0.38	52.42 ± 2.56
Extract	40	38.18 ± 1:05	90:10 ± 1:18
	50	33:25 ± 0.28	74:20 ± 0.08
	60	33:52 ± 1:28	40:10 ± 2:00
	70	33:19 ± 0:78	44:45 ± 1:17
	80	53:44 ± 1:30	110:2 ± 0.80
	90	42:24 ± 1:12	115:4 ± 0.60
	100	48.55 ± 1:08	120.8 ± 0.67

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III.RESULTS AND DISCUSSION

The preliminary phytochemical screening showed the presence of tannins and flavonoids in the aqueous methanolic extracts of *Euphorbiahirta*. The results of the present study declared that the crude aqueous methanolic extract of *Euphorbiahirta* produced anthelmintic activity against earthworms (*Pheretimaposthuma*). The concentrations of 50mg/ml, 60mg/ml, and 70mg/ml paralysed at the same time but the time taken for death differed. Out of these three concentrations, the plant showed optimum anthelmintic activity at 60 mg/ml concentration measured by time taken for paralyse or death of the earthworms (Table 1). Potency of the extract was inversely proportional to time taken for paralysis and death for earthworms. 60mg/ml shows prime action. Other than at higher (100) or lower (40) concentration it showed its activity at sub maximum concentration (60). Evaluation of anthelmintic activity was compared with reference standard albendazole of various concentrations. The present study revealed that the combinational form of aqueous methanolic extract endue better anthelmintic property.

IV. CONCLUSION

Finally it can be concluded that the aqueous methanolic extract of *Euphorbiahirta* shows significant anthelmintic activity against earthworms. The current study leads to conclusion that aqueous methanolic extract of plant possess potent activity when compared with the prevalent used drug. Further investigation is needed in order to isolate the phytochemical constituents responsible for anthelmintic activity.

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