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Evaluation of *in vitro* anthelmintic activity of *Acalypha rhomboidea*

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Abstract
The present study explores that the evaluation of *in vitro* anthelmintic activity of aqueous leaf extract of *Acalypha rhomboidea* against Indian earthworm *Pheretima posthuma*. Four concentrations (25 mg/ml, 50 mg/ml, 75 mg/ml, 100mg/ml) were tested and results were expressed in terms of time for paralysis and time of death of worms. In this study, Albendazole was used as a standard drug. Aqueous leaf extract of *Acalypha rhomboidea* for anthelmintic activity has been demonstrated. *Acalypha rhomboidea* has shown significant activity at higher concentrations when compared to standard group (Albendazole).

Keywords: Anthelmintic activity, *Acalypha rhomboidea*, albendazole, aqueous extract, *Pheretima posthuma*

Introduction
Helminthic infections repeatedly entitled as helminthiasis. Parasitic diseases cause ruthless morbidity affecting population in endemic areas [1]. It is prevalent in tropical regions helminthic parasites mainly subsists in human intestine but also found in tissue and also mostly found in children. Gastrointestinal tract (GIT) helmenthics become resistant to currently available anthelmintic drugs, therefore, there is a fore most problem in the treatment of helmenthic diseases [2]. Anthelmintic drugs are used to expel or to kill the intestinal warms [3]. These worms contribute to anemia, eosinophilia, economic depression and malnutrition conditions [4]. The effects of these warms include stomach pain, headache, nausea, vomiting, leads to blood loss and deprives him for food, body pains, injury to organs, intestinal orlymphatic obstruction by secreting toxins [5]. It is estimated that by the year 2025 about 57% of population in developing countries will be influenced by this infection [6]. The WHO (World Health Organization) estimated that 80% of population in developed countries rely ontraditional medicine mostly plant drugs for their Primary Health Care needs [7].

About plant
Acalypha rhomboidea a plant in the spurge family, Euphorbiaceae. The species name *rhomboidea* means "diamond-shaped", and describes the leaves. This plant often grows in fertile loam, but it will tolerate gravelly or clay soil. The seeds are an attractive food source for birds such as the mourning dove and greater prairie chicken. Deer are known to browse *Acalypha*. spp. In crop fields where group two herbicides have been repeatedly used, this plant can become a serious and damaging weeds.

Materials and Methods
Collection of Plant material
Acalypha rhomboidea leaves were collected in the month of August 2019 from Kagazmaddur village, Narsapurmandal, Medak Dist of Telangana, India. The plant was authenticated by D. Venkateshwara Rao, Deputy Director, Telangana. Forest Academy, Dullapally, Hyderabad, Rangareddy District. The fresh leaves were collected, removed all earthy matter, washed, shade, dried and powdered by pulverizer.

Collection of Worms
Pheretima posthuma (earthworms) were collected from the manure and identified and washed with water to remove all kinds of dirty water from them.

Chemicals and Drugs Used
Aqueous extract, Normal saline, Albendazole

Preparation of Plant Extract

The leaves of plant were dried under shade and crushed in pulverizer and powdered. The powdered plant extracted with water for 48 hours by Maceration, after completion of the extraction, the extracts were cooled at room temperature and filtered and evaporated to dryness using rotary evaporator.

Preparation of Concentrations

The aqueous extract of *Acalypha rhomboidea* was made into four different concentrations suchas 25 mg/ml, 50 mg/ml, 75 mg/ml, 100 mg/ml by dissolving in normal saline. The standard control group Albendazole was prepared by using 0.5% w/v Carboxy Methyl Cellulose(CMC) as a suspending agent.

Evaluation of Anthelmintic Activity

The anthelmintic activity was carried according to standard method [8-9]. Adult Indian earthworm *Pheretima posthuma*has anatomical and physiological resemblance to the intestinal roundworm parasites of human beings. Indian earthworms were placed in a Petridish containing different concentrations (25 mg/ml, 50 mg/ml, 75 mg/ml, and 100 mg/ml) of ethanolic extract of *Acalypha rhomboidea* and standard drug Albendazole. Each Petri dish contains earthworms and observed for time of paralysis as well as time death. Time of paralysis recorded when no movement of any sort could be observed, except when the worm was shaken vigorously as well as time of death was recorded after ascertaining that worms neither moved when shaken. Finally, the test results were compared with standard reference compound Albendazole.

Results and Discussion

Aqueous extract of *Acalypha rhomboidea* exhibited anthelmintic activity. At higher concentration, the activity is more. According to observations, the aqueous extract produced paralytic effect earlier and death was faster. The extract shows maximum efficacy at 100 mg/ml when compared with the standard drug (Albendazole). The results were displayed in table 1. From the above results, we can conclude that *Acalypha rhomboidea* exhibited significant anthelmintic activity. Therefore, further study must be carried out so that the general peoplecan get actual benefit from this important medicinal plant.

Table 1: Anthelmintic activity of aqueous extract of *Acalypha rhomboidea* and Albendazole

Extract	Concentrations (mg/ml)	Paralysis (min)	Death (min)
Aqueous extract	25	49 ± 0.62	67±0.84
	50	44±0.25	63±0.45
	75	39±0.91	58±0.33
	100	35±1.24	42±0.96

Extract	Concentrations (mg/ml)	Paralysis (min)	Death (min)
Albendazole	25	40±0.43	43±1.38
	50	36±0.60	38±0.59
	75	30±0.81	29±1.38
	100	22±1.4	23±0.9

Fig. 1: Anthelmintic activity of aqueous extract of *Acalypha rhomboidea*

Conclusion

It can be concluded that the aqeous leaf extract of *Acalypha rhomboidea* produces better anthelmintic activity against Indian earth warm *Pheretima posthuma*. At higher concentrations, the aqueous extract showed higher activity.

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