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Preliminary phytochemical screening and *in vitro* anthelmintic activity of *Cyperus rotundus* (L)

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Abstract

The present study aimed at the *in-vitro* anthelmintic activity of Methanolic extract of *Cyperus rotundus* (L) at two different concentrations (20, 50mg/ml). The extract were taken for anthelmintic activity against Indian earthworm *Pheretima posthuma*. The results were expressed in terms of time required for paralysis and death of *Pheretima posthuma*. Albendazole is used as a standard control group. *Cyperus rotundus* shows the significant activity at higher concentrations when compared to a standard control group (Albendazole).

Keywords: *Cyperus rotundus*, *Pheretima posthuma*, anthelmintic, methanolic extract, phytochemical screening

1. Introduction

Plants serves as a constant source of medicament for the treatment of variety diseases [1]. Phytochemical are naturally occurring in the medicinal plants, leaves, roots, rhizomes and vegetables that have defense mechanism and protect the human beings from various diseases like diabetes, cancer, atherosclerosis etc. The medicinal value of plants lies some chemical substances that produce a definite physiological action on the human body [2]. Intestinal parasitic infections are one of the main health problems in human beings particularly in children. Most diseases caused by helminthes are of chronic, debilitating nature; they probably cause more morbidity and greater economic and social deprivation among humans. Helminthics are drugs that may act locally and expel worms from the GIT [3]. Plants provides all needs in terms of food, cloth, shelter, medicines etc. Most of the helminthics produces side effects such as abdominal pain, nausea, vomiting, diarrhea [4]. 80% world's population in developing countries uses plants as primary source for better health [5]. Parasitic infections affects human beings as well as animals. Medicinal plants are back bone of traditional medicine, which more than 3.3 billion people in the less developed countries utilize medicinal plants on regular basis [6]. *Cyperus rotundus* exhibit multiple effects like hepatoprotective, anti-oxidant, anti-fungal, anti-malarial, anti diarrhoeal etc. The present study carries preliminary phytochemical screening and anthelmintic activity.

Cyperus rotundus found hotter parts of India. The leaves were used as adjunct to medicines used for pile complaints. It is also known as nut grass, purple nut sedge and Java grass. *Cyperus rotundus* reach a height of 140cm (55inches). It belongs to *cyperaceae* family. It is used in intreatment of nausea, vomiting, dysentery, intestinal parasites, fever, malaria, cough, skin diseases and wounds.

2. Materials and Methods

2.1 Collection of plant material

Cyperus rotundus leaves were collected in the month of July 2016 from Kagazmaddur village, Narsapur, Medak dist. of Telangana, India and the plant was authenticated by D. Venkateshwara Rao, Deputy Director, A.P Forest Academy, Dulapally, Hyderabad, after the authentication the fresh leaves were collected, removed all earthy matter and washed and shade dried and powdered by using pulveriser.

2.2 Collection of worms

Pheretima posthuma was collected from the soil and identified and washed with water to remove all kinds of dirty matter from it.

2.3 Chemicals and drugs used

Methanol, Albendazole, CMC (Carboxymethyl Cellulose), Normal saline.

2.4 Preparation of plant extract

The leaves of plant were dried under shade and crushed in pulveriser and powdered. These powdered plant material was extracted with methanol in a soxhlet apparatus for 72 hours. After complete the extraction, the extracts were cooled at room temperature and filtered and evaporated to dryness using rotary evaporator.

2.5 Preliminary phytochemical investigation

The extract was subjected to preliminary phytochemical screening to identify the phyto constituents such carbohydrates, sterols, amino acids, proteins, saponins, flavanoids, tannins, resins using standard methodologies [7, 8].

2.6 Preparation of concentrations

The methanolic extract of *Cyperus rotundus* (20mg/ml, 50mg/ml concentrations) were prepared by dissolving in normal saline. Standard control group (Albendazole) also prepared by using 0.5% CMC (Carboxy Methyl Cellulose) as suspending agent. The volume is made upto 10ml for respective concentrations.

2.7 Evaluation of anthelmintic activity

The anthelmintic activity was performed according to the method [9]. On adult Indian earth worm *Pheretima posthuma* as it has anatomical and physiological resemblance with the intestinal round worm parasites of human beings. *Pheretima posthuma* was placed in petri dish containing different concentrations of methanolic extract of leaves of *Cyperus rotundus* and Standard compound Albendazole. Each petri dish was placed with 2 worms and observed for paralysis or death. Mean time for paralysis was noted when no movement of any sort could be observed, except when the worm was shaken vigorously; the time death of worm (min) was recorded after ascertaining that worms neither moved when shaken nor when given external stimuli. The test results were compared with Reference compound Albendazole treated

samples.

3. Results and discussion

Investigation of phytochemical screening reveals that the presence of carbohydrates, alkaloid, tannins, glycosides. Methanolic extract of *Cyperus rotundus* exhibited anthelmintic activity. At higher concentration the activity is more.

According to observations the methanolic extract produced paralytic effect earlier and death was faster. The extract shows maximum efficacy at 50mg/ml when compared with the standard drug (Albendazole). The results were displayed in table.2. From the above results, we can conclude that, *Cyperus rotundus* exhibited significant anthelmintic activity. Therefore, further study must be carried out so that the general people can get actual benefit from this important medicinal plant.

Table 1: Preliminary Phytochemical Screening of *Cyperus rotundus*

Constituents	Methanolic extract
Carbohydrates	+
Amino acids	+
Flavanoids	+
Steroids	+
Glycosides	+
Anthraquinone	-
Saponins	+
Tannins	+
Starch	+

Note: + (present) -(absent)

Table 2: Results of anthelmintic activity of *Cyperus rotundus* (Methanolic extract) and standard drug

Extract	Concentrations (mg/ml)	<i>Pheretima posthuma</i>	
		Paralysis (mins)	Death (mins)
Methanolic Extract	20mg/ml	23 min \pm 2.09	30 min \pm 1.98
	50mg/ml	15 min \pm 0.89	23 min \pm 1.0
Albendazole (standard drug)	20mg/ml	15min \pm 13	19 min \pm 15
	50mg/ml	12min \pm 18	16 min \pm 21



A: 20mg/ml



B: 50mg/ml

4. Conclusion

The results of the present study indicated that the methanolic extract of *Cyperus rotundus* produce better anthelmintic activity against Indian earthworm *Pheretima posthuma*.

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