



## ANTHELMINTIC EVALUATION OF THE RHIZOMES OF THE PLANT *CYPERUS TEGETUM* ROXB

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### ABSTRACT

*Cyperus tegetum* Roxb is found in the tribal area of Paschim Mednapur district of West Bengal and extensively used traditionally by the tribal people as febrifuge, anti-infective, digestive, laxative, in headache, cold and flu, mouth sores, ulcer, anti-hypertensive and anthelmintic. The present study was conducted to explore the anthelmintic activity of aqueous extract of rhizomes of the plant *Cyperus tegetum*. The various doses of extract were screened for their anthelmintic activities on adult Indian earthworms, *Pheretima posthuma*. The aqueous extract was found to show anthelmintic activity at 25 mg/ml concentration. The activity was comparable with the standard drug Piperazine citrate. The doses of aqueous extract of *Cyperus tegetum* showed better anthelmintic activity as compare to Piperazine citrate. When the dose of the extract was increased, a gradual increase in anthelmintic activity was observed.

**Keywords:** Anthelmintic activity, *Cyperus tegetum*, *Pheretima posthuma*, aqueous extract, Piperazine citrate.

### INTRODUCTION

Helminthiasis, or worm infection, is one of the most prevalent disease and one of the most serious public health problems in the world. Hundreds of millions if not billions of human infections by helminthes exist worldwide and with increased world travel and immigration from the developing countries<sup>1</sup>.

*Cyperus tegetum* Roxb (Cyperaceae) is also commonly called as Madhur kathi. The plant stems are 5 to 6 ft long, erect, unbranched, three sided and triangular in cross section, stems are usually solitary and produce terminal spikelets. Rhizomes and tubers occur on the same plants. Tubers are cylindrical, branched and initially pungent in taste. *Cyperus tegetum* Roxb produces chains of tubers that develop along the entire rhizomes of 0.5 to 1 cm in diameter, around 10 cm long, growing horizontally, just below the surface<sup>2</sup>.

On literature survey, it was found that a number of plants belonging to the *Cyperacea* family are traditionally used as carminative, anti-dysentric, stomachic, astringent, anthelmintic, in leprosy, puriritus, epilepsy etc. Scientific research also shows that *Cyperus* plant exhibit various pharmacological activities like anti-diabetic<sup>3</sup> anti-oxidant<sup>4</sup>, anti-diarrhoeal<sup>5</sup>, anti-inflammatory<sup>6</sup>, anti-convulsion<sup>7</sup>, as a sedative<sup>8</sup> etc, whereas there is no scientific report on the pharmacological activities of the plant *Cyperus tegetum* Roxb. The present study deals with anthelmintic activity of the aqueous extract of the plant *Cyperus tegetum*.

### MATERIALS AND METHODS

#### Plant material

The rhizomes of plant *Cyperus tegetum* Roxb (Family: Cyperaceae) were collected from the cultivated land of Paschim Mednapur, West Bengal, in the month of June-

July. Botanical Survey of India, Kolkata, taxonomically identified the plant. A voucher specimen (No.CNH/I-I (197)/2007/Tech.II/161) has been preserved in our laboratory for further reference.

#### Preparation of extract

To evaluate the pharmacological activity of rhizome of *Cyperus tegetum* Roxb, aqueous extract was prepared with successive extraction with pet ether, chloroform and ethanol. The aqueous extract was found to be 9.2% and it was evaluated for anthelmintic activity.

#### Worm Collection

Indian earthworm, *Pheretima posthuma* was used for evaluating the anthelmintic activity due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings<sup>9-11</sup>. They were collected from local place, washed and kept in water.

#### Procedure

The assay was performed on adult Indian earthworm *Pheretima posthuma*. 50 ml formulations containing different concentrations of crude aqueous extract (25, 50 mg/ml in distilled water) were prepared. The worms were divided into four groups containing five earthworms in each group. Five earthworms were placed in each 50ml formulation. Group.1 was treated as control which received only distilled water, Group 2 and 3 were treated as test groups and aqueous extract of concentration 25 and 50 mg/ml were given to these groups respectively and Group 4 was treated as positive control which was treated with reference standard drug Piperazine citrate (10 mg/ml)<sup>12-14</sup>. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously or dipped in warm water (50°C).



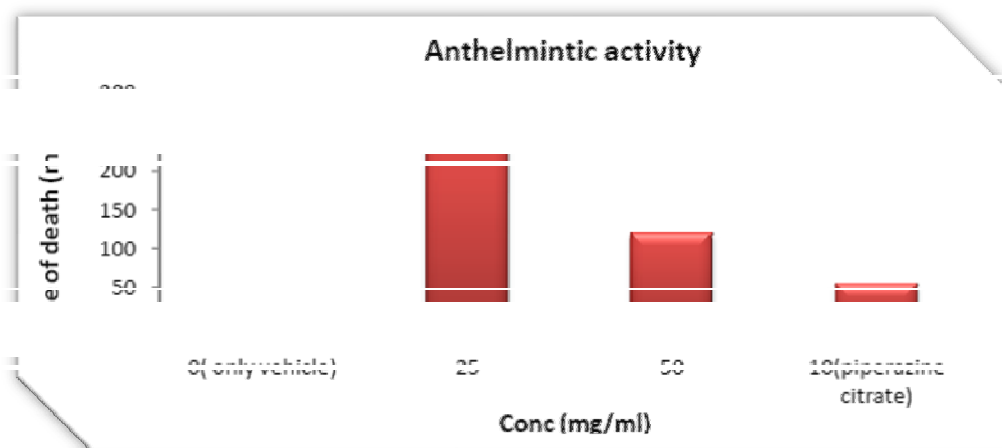
## RESULTS AND DISCUSSION

The water extract of *Cyperus tegetum* exhibited anthelmintic activity in dose dependent manner given short test time of paralysis (P) and death (D) with 25, 50 mg/ml concentration. The water extract caused paralysis

of earthworm in 60 min and death in 120 min respectively. The reference drug piperazine citrate showed the same response at 25 min and 55 min respectively. The results are shown in Table 1 and graph no 1

Table 1 Anthelmintic activity of the aqueous extract of *Cyperus tegetum* on *Pheretima posthuma*

Sl No.	Treatment	Concentration used (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
Group 1	Distilled water	–	–	–
Group 2	Aqueous extract	25	120	240
Group 3	Aqueous extract	50	60	120
Group 4	Piperazine Citrate	10	25	55



Graph 1: Anthelmintic activity of the aqueous extract of *Cyperus tegetum* rhizomes on *Pheretima posthuma* (Concentration vs Time of death in min)

## CONCLUSION

It is concluded that the aqueous extract of *Cyperus tegetum* showed potent anthelmintic activity. The present study revealed that the anthelmintic activity increasing with increasing doses. Potency of the extract was found to be inversely proportional to the time taken for paralysis/ death of the earthworm. Further studies are required to identify the actual chemical constituents that are present in crude extract of this plant which are responsible for anthelmintic activity and to establish the effectiveness and pharmacological evaluation for the use of *Cyperus tegetum* as an anthelmintic drug.

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