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Short Communication

Sedative Properties of Methanol Extract of Rhizome of *Cyperus Tegetum* Roxb.

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ABSTRACT

In this study, the methanol (MeOH) extract of rhizome of *Cyperus tegetum* Roxb, belonging to the family Cyperaceae was prepared by successive extraction procedure (petroleum ether, chloroform, methanol) in Soxhlet apparatus and subsequently, the extract was evaluated for its phytoconstituents and pharmacological activity. Comparatively, higher yield (5.4%) of methanol extract was obtained. Phytochemical tests revealed the presence of alkaloid, glycosides, proteins, amino acids, phenolic compounds, flavonoids, tannins and saponins in the extract. The methanol (MeOH) extract of the rhizome of was used to evaluate the pharmacological properties. The extract does not possess either anesthetic or paralysing effect on test animals but spontaneous motor activity is significantly reduced by the extract. When associated with pentobarbitone sodium or diazepam, the MeOH extract facilitates sleep inductin and increases total sleeping time .These observation suggests that the rhizome of C *tegetum* has pharmacological properties similar to those of sedatives.

Keywords*: Cyperus tegetum* Roxb, Sedative properies, Pentobarbitone sodium, Diazepam

INTRODUCTION

Psychiatric disorders are increasing problems in modern civilization. Available antipsychotics are associated with variety of autonomic, endocrine, allergic, hematopoietic and neurological side effects. As a result there is high prevalence of usage of complementary and alternative medicines for treatment of psychiatric disorders. In the search for new therapeutic products for the treatment of neurological disorders, medicinal plant research, worldwide, has progressed constantly, demonstrating the pharmacological effectiveness of different plant species in a variety of animal models[1].

In present study, we carried out the sedative activity the plant *Cyperus tegetum* Roxb. belonging to the family Cyperaceae is a glabrous and robust perineal sedge[2] found throughout India up to an altitude 1800m. The plant is commonly known as mat stick, madur kathi(Bengali) and cultivated as an economic crops in Paschim Midinipur district of West Bengal and traditionally used by the tribal people for the treatment of cachexia, atrophy and snake bite[3]. Going through the literature survey, although activities like anticonvulsant[4], sedative[5], antimalarial[6], antidiarrhoeal[7], antidiabetic[8] etc. have been reported by several research workers on the other plants belong to Cyperaceae family, however there is no scientific report on the plant *Cyperus tegetum* Roxb of same family. Therefore the objective of the present investigation was to explore its phytoconstituents and probable pharmacological activity.

MATERIALS AND METHODS

Plant material

The plant *Cyperus tegetum* Roxb (Family:Cyperaceae) was collected from the cultivated land of Paschim Medinipur, West Bengal in the month of June-July. Botanical Survey of India taxonomically identified the plant. A voucher specimen (CNH/I-I (198)/2007/Tech.II/162) has been preserved in our laboratory for further references. The rhizomes were washed, dried at room temperature under shed and then grounded in a mill to a coarse powder.

Extraction of plant materials

The powdered rhizomes were subjected to successive Soxhlet extraction using a series of solvents of increasing polarity starting from petroleum ether, chloroform, and methanol respectively. The extracts were vacuum dried and the percentage yields of the extracts were 2.1%, 3.0%, and 5.4%, respectively.

Preliminary phytochemical analysis

The phytochemical tests were performed using various reagents as described in Table 1. The MeOH extract was tested for the presence or absence of alkaloid, glycosides, tannins, steroids, reducing sugars, proteins and amino acids, phenolic compounds and flavonoids(Table.1).

Acute toxicity study

The acute toxicity of methanol (MeOH) extract of *Cyperus tegetum* Roxb was studied on Swiss albino mice (20-25 gm) following Karber's method. The Institutional Animal Ethical Committee permitted the use of the

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Table. 1: **Preliminary phytochemical screening of Argyreia speciosa roots.**

Phytoconstituents	Test performed/reagents used	Presence or absence
Alkaloid	Mayers test	+
	Dragendorffs test	+
	Hagers test	+
Steroid	Libermann-Burchard test	-
Flavonoids	Shinoda test	+
Tannins	Ferric chloride	+
	Lead acetate	+
Saponin	Test for stable foam	+
Glycoside	Borntager test	-
Protein and amino acid	Ninhydrin test	+
Reducing suger	Fehlings test	+
	Benedict test	+

animals for this purpose. After fasting condition for overnight, the animals divided into six groups (four in each group), were administered a dose of 100, 200, 400, 800, 1600 and 3000 mg/ kg BW intraperitoneally. No animals were found died after 24h..

Animals and treatment

Swiss mice of either sex, weighing 25-30g, were used. They were housed in environmental conditions and fed with standard food for rodents and water, *ad libitum*. Treatments were administered intraperitoneally in a volume of 10 ml/kg BW.

Table 3: **Duration of sleep induced by pentobarbital sodium in mice**.

Treatment	Dose mg/kg b.w	Sleeping time (min) Mean ± sd
Gr.1 (Control)	0	23.4±5.458938
Gr.2 (MeOH extract)	100	36.2±4.266146
Gr.3 (MeOH extract)	200	52.4±6.618157
Gr.4 (MeOH extract)	400	77.4±5.59464
Gr.5 (MeOH extract)	800	119.4±11.1040

Spontaneous motor activity

The Spontaneous motor activity (SMA) was measured using an actophotometer. The movement of the animal cuts off a beam of light falling on the photocell and a count was recorded and displayed digitally. The animals (Swiss Albino mice) were divided into five groups contains five animals in each group. In control group, mice were injected (I.P.) with vehicle, in positive control group mice were treated with chlorpromazine (3 mg/kg bw.ip.) and in test group, mice were injected (I.P.) with ethanol extract of at a dose of 200, 400, 600 mg/kg b.w.

Table. 2: **Actophotometer reading before and after treatment**

Treatment	Dose (mg/kg b.w)	Actophotometer reading		% Decrease
		Before treatment	After treatment	
Gr.1 (Control)	0	128.0	127.6	0.31
Gr.2 (MeOH extract)	200	142.8	113.6	20.45
Gr.3 (MeOH extract)	400	126.2	92.6	26.62
Gr.4 (MeOH extract)	600	98.0	41.4	57.76
Gr.5(Chloropromazine)	3	101.6	12.8	87.41

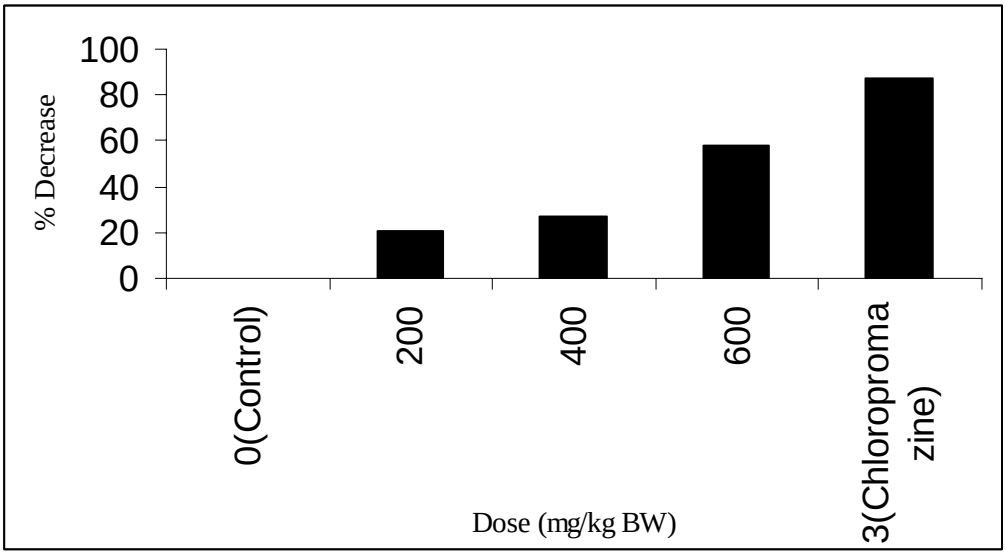

Fig.1: **Effect of MeOH extract of *C tegetum* rhizome on spontaneous motor activity**

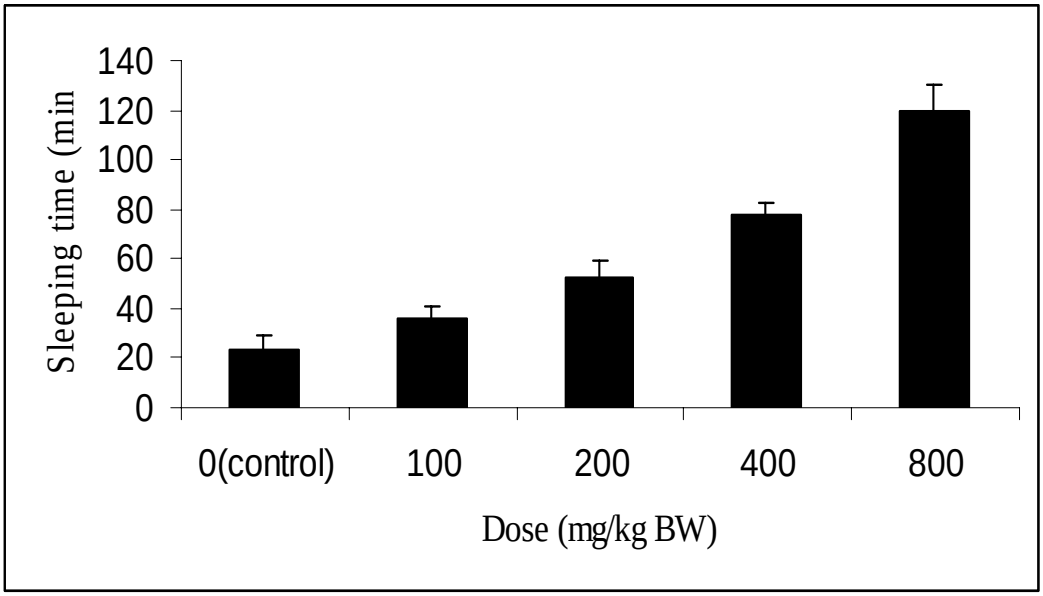

Fig 2: **Effect of MeOH extract of *C tegetum* rhizome on duration of sleep induced by pentobarbital sodium in mice. n=5. Each bar expressed as mean ± SEM.**

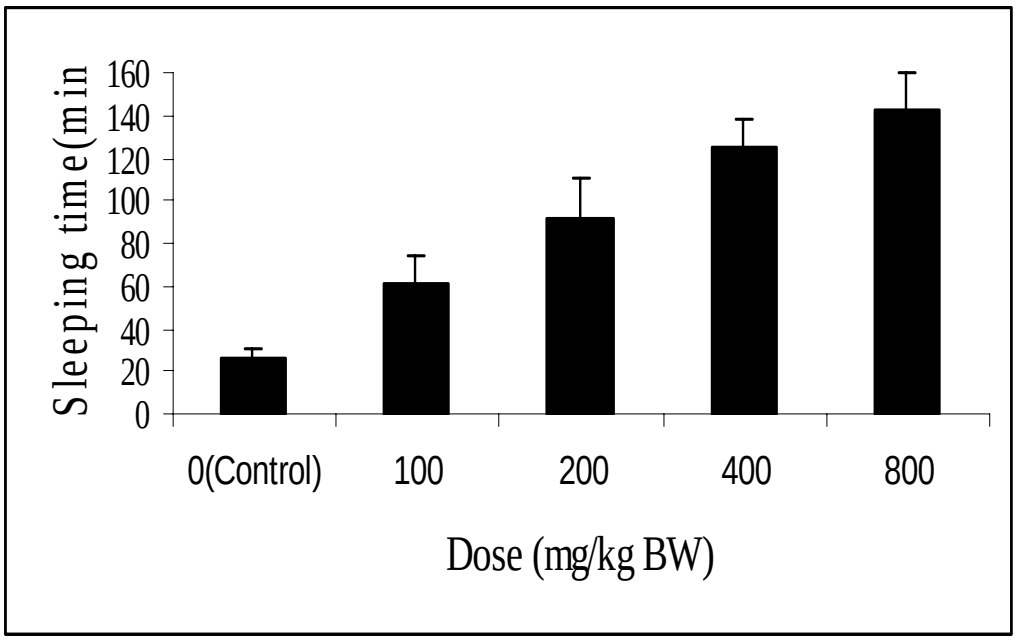

Fig3: **Effect of MeOH extract of *C tegetum* rhizome on duration of sleep induced by diazepam in mice. n=5. Each bar expressed as mean ± SEM**

Table 4: duration of sleep induced by diazepam in mice.

Treatment	Dose mg/kg b.w	Sleeping time (min) Mean ± sd
Gr.1 (Control)	0	26.6±4.505552
Gr.2 (MeOH extract)	100	61.8±11.7771
Gr.3 (MeOH extract)	200	91±20.13703
Gr.4 (MeOH extract)	400	124.8±13.80942
Gr.5 (MeOH extract)	800	143±17.2771

Each mouse was placed individually in the actophotometer for 5 min and basal activity score was obtained. After 30 min of treatment, mice was placed again in the actophotometer for recording the activity score[9].

Effect of MeOH extract on the pentobarbitone sodium induced sleep

Sleep potentiation effects of the plant extract was studied in mice that received pentobarbitone sodium at a dose of 45 mg/ kg BW 30 min after IP injection of the extract at different concentrations and distilled water for control group. The difference between the disappearing and recovery of the wrighting reflex is the sleeping time.

Effect of MeOH extract on the Diazepam induced sleep

The method described by Beretz *et al.*1978 was used with modifications[10]. Sleep potentiation effects of the extract have been studied in mice using diazepam at 10 mg/kg b.w intraperitonially. After i.p injection, the extract at different concentrations and distilled water for control group was administered. The difference between the disappearing and recovery of the wrighting reflex is the sleeping time.

RESULT AND DISCUSSION

The study of the effects on the spontaneous motor activity show that *C. tegetum* could decrease by 57.76 % the frequency and the amplitude of movements where as standard chloropromazine decrease 87.41%(Table.2). Since sedatives decrease motility[11], the reduction of the spontaneous motor activity (Fig.1) could be attributed to a sedative effect of the extract. The MeOH extract of the rhizome potentiate potentiated the total sleeping time induced by pentobarbitone sodium(Table.3) and diazepam(Table 4). The extract lengthened by six times and five times the total sleep time induced by pentobarbitone sodium(Fig.2) and diazepam(Fig.3), respectively The potentiation of the barbiturateand diazepam induced sleep suggests that *C. tegetum* possesses some sleep inducing properties[5,11]. The two aspects of its sedative effect, lengthening total sleep time and facilitating sleep induction, would account at least partly for the decrease of the spontaneous motor activity. To conclude, our results show that the MeOH extract of the rhizome of *C. tegetum*, administered intraperitoneally, possesses properties that decrease the spontaneous motor activity and potentiate the hypnotic effect of pentobarbitone sodium and diazepam. Although our administration route is not the one used traditionally *C. tegetum* could then truly be endowed with the sedatives properties exploited in the traditional medicine in order to treat some diseases of the central nervous system.

CONCLUSION

The neuropharmacological effects determined in the present study suggest that the rhizomes of *Cyperus tegetum* produce a significant central nervous depressant activity which may be due to sedative property. This study provides experimental support for the use of this plant in nervous disorders.

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