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RESEARCH ARTICLE

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CNS Activity of the Methanol Extracts of *Acalypha indica linn* in Experimental Animal Model

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ABSTRACT

The aim of this present study is to investigate central nervous system activity of the methanol extract of leaves of Acalypha indica in Swiss Albino mice. Acalypa indica linn leaves is known to contain carbohydrates, alkaloids, sterols, saponins, phenolic compounds, glycosides, and flavonoids and is reported to have anti-microbial,anti-inflammatory,anti-fertility,anti-diabetic,anthelmintic,analgesic,anti-inflammatory,Nitricacid scavenging activity and anti-ulcer activity. Since leaves of Acalypa indica linn is used as folk medicine in treatment of insomnia, we made an attempt to study its muscle relaxant activity. The leaves are extracted with methanol and investigated for its central nervous system activity of Albino mice in Rota-rod and traction test at the dose level of 200mg/kg. These results suggest that the extract possess CNS depressant activity.

Keywords: *Acalypa indica linn* , CNS depressant activity, Diazepam, Rota rod, Swiss albino mice.

INTRODUCTION

Acalypa indica linn belongs to the family Euphorbiaceae. It is a common annual shrub in Indian gardens, back yards of houses and waste place throughout the plains of India, path breaking research is Pschyopharmacology has flooded the market place with drugs for specification. For instance, benzodiazepines are the most frequently prescribed synthetic drugs for variety of condition particularly anxiety, depression, epilepsy and insomnia.

But these psycho neural drugs have very serious side effects like chronic use of benzodiazepines causes deterioration of cognitive function, physical dependence and tolerance. Besides addiction liabilities benzodiazepines adversely affect the respiratory, digestive and immune system of body and the chronic treatment with benzodiazepines often prove more harmful in the longer run[1]. Natural sources mainly in plant products as seen and there is tremendous hope that drug of plant origin will have significantly lesser side effects than that observed with synthetic drugs while having comparable efficacy. The leaves *Acalypa indica linn* contains carbohydrate, Alkaloids, Sterols, Saponins, Phenolic compounds, Glycosides and Flavonoids and its reported to have anti-microbial[2], anti-fertility[3], anti-diabetic[4], anthelmintic[5], analgesic and anti-inflammatory[6], Nitricacid scavenging activity[7] and anti-ulcer activity[8].

Acalypa indica linn is used as folk medicine in treatment of insomnia based on the above information , we thought it is worth while to evaluate the methanolic extract of leaves of *Acalypha indica linn* for CNS depressant activity.

MATERIALS AND METHODS

The leaves of *Acalypa indica linn* was collected in march 2013 from S.V.university, Tirupathi, Andhra pradesh, India. The plant material was taxonomically identified by the botanist Dr. K. Madhavachetty and the voucher specimen was retained in our laboratory for future reference. The dried powder material (500g) of the leaves of *Acalypa indica linn* was extracted with 2000ml of methanol in a Soxhlet apparatus. The methanol extract was distilled, evaporated and dried in vaccum. The resulted extract yield was 7.45% and the appearance of the extract

was dried gum resin in nature. The chemical constituents of the extract were identified by qualitative analysis followed by their conformation through the literature.

Experimental Animals:
Studies were carried out using Swiss Albino mice (20-25g) of either sex. They were obtained from the animal house, NIN, Hyderabad, India. The animals were grouped and housed in polyacrylic cages (38×23×10cm) with not more than eight animals per cage and maintained under standard laboratory conditions temperature (25± 2ºc) with dark and light cycle (14/10hr). They were allowed free access to standard dry pellet diet (Hindustan Lever, Kolkata, India) and water ad libitum. The mice were acclimatized to laboratory condition for 10 days before commencement of experiment. All procedures described were reviewed and approved by the animal's ethical committee.

Preliminary phytochemical analysis:
The Methaolic extract of *Acalypa indica linn* was subjected to preliminary phytochemical screening. [9]

Drugs:
Diazepam (lupin laboratories Ltd. India), is used as a standard drug for all the models.

Dose selection:
The dose was selected according to the data obtained from the literature.

Muscle relaxant activity:
The effect of extracts on muscle relaxant activity was studied by the
a) Traction test
b) Rota-rod test

Traction test:
This test is performed by Placing the fore paws of the mice in a small twisted wire rigidly supported above the bench top for the screening of the animal. Normally the mice grasp the wire with the forepaws, and place at least one hind foot on the wire without 5 second when allowed to hang free. The test was conducted on 3 groups of animals (n=6) that were previously screened, 30 min after the injection of methanolic extract of *Acalypa indica* (200mg/kg), diazepam (5mg/kg), or control (5ml/kg) as a vehicle. Inability to put up at least one hind foot considered failure in the traction test.[10]

Rota-rod test:
Fresh mice were placed on a horizontal wooden rod (32mm diameter) rotating at a speed of 5rpm. The mice capable of remaining on to top for 3min or more, in three successive trials were selected for the study. The selected animals were divided into 3 groups (n=6). Methanolic extract of *Acalypa indica* at the dose of 200mg/kg were injected intra peritoneally into group I, group II, received control 5ml/kg and group III, received diazepam 5mg/kg was administered. Each group of animals was then placed on the rod at an interval of 30, 60, 90, 120 and 150 min. The animals failed more than once to remain on the Rota rod for 3 min were considered as fail.[11]

Statistical analysis:
Data were expressed as mean±SE. Statistical analysis was done using one-way analysis of variance (ANOVA) followed by dunnett's test comparison. Values were considered statistically significant when at $p<0.05$.

RESULTS

Effect of Methanolic extract of *Acalypa indica* on Muscle relaxant activity (Traction test and Rota rod test).

S.NO	Experiment	Traction test	Rota rod (fall off time in sec	
			Basal reaction time	After drug treatment
1.	Control	0	29.28	31.32±3.78***
2.	Standard	100	31.50	7.54±3.71
3.	MEAI	70*	24.02	11.32±2.04**

*Values are the number of head dips in 3min (Mean±SEM, n=6). Significant difference between control and treated group;*p<0.05, **p<0.01, ***p<0.001, ANOVA followed by Dunnett's multiple comparison test.*

DISCUSSION

The myorelaxant effect was observed only with the higher dose of Methanolic extract of *Acalypa indica* which resulted in an increase in the number of falls and a decrease in the time on the bar as detected by the Rotarod test.

However, further investigation is underway to determine the exact phytoconstituents that are responsible for CNS depressant activity of Methanolic extract of *Acalypa indica* and the receptors involved for the execution of the activity.

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