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Research Article

COMPARATIVE STUDIES OF CENTRAL NERVOUS SYSTEM DEPRESSANT ACTIVITY ON ETHANOLIC EXTRACT OF *ALLMANIA NODIFLORA* (L.) R.BR. EX WIGHT AND *EUPHORBIA HIRTA*

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ABSTRACT

The whole plant extract of*Allmania nodiflora* (L.) R.Br. ex Wight and *Euphorbia hirta* obtained cold extraction ethanol was chosen for pharmacological screening. The Swiss albino mice were subjected to extract at 200 mg/kg to check the CNS depressant activity by Actophotometer and Rotarod method.The test and standard were given orally. After 60 min. the animal are placed in to the ActophotometerandRotarodobservation were recorded at the interval of 30, 60,90, 120, and 180 min. *Allmania nodiflora* (L.) R.Br. ex Wightshowed less CNS depressant effect and*Euphorbia hirta*has shown significant CNS depressant activity.

Keywords: *Euphorbia hirta*, CNS depressant, *Allmania nodiflora* (L.) R.Br. ex Wight Actophotometer.

INTRODUCTION

Allmania nodiflora (L.) R.Br. ex Wight(amaranthaceae) is diffuse or an erect herb;these are widely distributed in cultivated waste lands.This plant is commonly known as errabadhiaku (telugu)[1]. The other genus of *Allmania*has possibly been introduced as green leafy vegetable, good nutritive and iron content[2]. No any activities were reported on this plant.

Euphorbia hirta (euphorbiaceae) commonly called Reddivarinanabalu (telugu)[3]ditrubuted in open grassland, roadsides and pathways.It is widely used as medicinal plant in most of the places[4]. The reported activities are anti fungal[5], antibacterial[6], and antidiabetic[7] and antioxidant activity[8,] sedativeand anxiolytic[9], antihelminthic[10,] antitumor[11], antiulcer activity[12]. The phytochemical screening shows presence of flavanoids, poly phenols, tannins, triterpinoids and phytosterols[13].

MATERIALS AND METHODS

PLANT MATERIAL

The whole plant of *Allmania nodiflora* (L.) R.Br. ex Wightand *Euphorbia hirta*was collected separately from in and around places of Raghu College of Pharmacy in October 2014, *Allmania nodiflora* (L.) R.Br. ex Wightwas authenticated by Botanical Survey of India, Hyderabad, Telangana (state) with voucher specimen number BSI/DRC/2015-16/Tech/684 and *Euphorbia hirta*was authenticated by Prof. S.B.PadalMsc. Phd. PGDCA professor of Botany department, Andhra University, Visakhapatnam, with voucher specimen

number in 22204 Botany Department Herbarium Andhra University.

All the experiments were carried out using Swiss albino mice (25-30 gm) male of age 12 weeks. All the experimental procedure and protocols used in this study are reviewed and approved by the Institutional Animal Ethical Committee (IAEC) of Raghu College of pharmacy contributed in accordance with guidelines of the CPCSEA, government of India.

All the mice were given a period of acclimatization for 14 days before starting the experiments. Mice were fed pellet diet, and water ad libitam, temperature maintaining at 24± 2° and relative humidity 60-70%. These male Swiss albino mice were divided into five different groups each containing six animals, the animals were marked individually.

The chemicals used for these experiments were procured from various sources i.e.Carboxy Methyl Cellulose (Oxford laboratory Mumbai) ethanol (Jiangsu Huaxi International trade Co. Ltd) and drugs like diazepam(Pfizer pharmaceuticals Ltd.Mumbai) and chlorpromazine (Sun Pharmaceutical Industries Ltd. Mumbai) were used during the experimental protocol.

Extraction and preparation of sample

The whole plants separately were dried under shade and coarsely powdered and subjected to extraction with ethanol by simple maceration process. The extract of whole plants were concentrated to ¾ th of original volume by using rotary evaporator at 40° C under reduced pressure. The concentrated extract of *Allmanianodiflora and Euphorbia hirta* were subjected to preliminary chemical test for detection of phytoconstituents; give positive result for steroid, triterpinoid and phenols. The dried extract was suspended in 1% sodium CMC in distilled water and used for pharmacological investigation.

Acute oral toxicity study

Acute Toxicity Study was carried out for the determination of LD_{50} value of ethanolic extract of *Allmania nodiflora* (L.) R.Br. ex Wightand *Euphorbia hirta*in experimental animals. The study was performed as per OECD guidelines 423. By this procedure LD_{50} of hydro alcoholic extract of *Allmania nodiflora* (L.) R.Br. ex Wightand *Euphorbia hirta*was found to be 2000mg/kg, as given in table no: 1 and 2.

METHOD

1) **ACTOPHOTOMETER METHOD**

The CNS depressant activity of the extracts is measured byActophotometer test[14]. Swiss albino mice weighing between 25-30g were used for evaluation of CNS depressant activity in each group six albino mice were kept. A suspension of chlorpromazine was prepared in normal distilled water with 2% sodium CMC. Suspensions of plant extracts were prepared by using Sodium CMC suspension. Male Swiss albino mice were divided into five different groups each containing six animals, the animals were marked individually. Food was withdrawn 12 hours prior to drug administration till completion of experiment. The animals were weighed and numbered appropriately. The test and standard drugs were given orally (as tabulated in Table-3).After 30 minutes, the animals are placed in to the actophotometer for 10 minsand the observations/counts were recorded and at the time interval of 60, 90, 120 and 180 minutes. The result of depressant activity in mice was tabulated in Table-4, 5.

2) **ROTA-ROD METHOD**

The CNS depressant activity of the extracts is measured byRota-rod test. Swiss albino mice weighing between 25-30g were used for evaluation of CNS depressant activity in each group six albino mice was kept. A suspension of diazepam was prepared in normal distilled water with 2% sodium CMC. Suspensions of plant extracts were prepared by using Sodium CMC suspension. Male Swiss albino mice were divided into five different groups each containing six animals, the animals were marked individually. Food was withdrawn 12 hours prior to drug administration till completion of experiment. The animals were weighed and numbered appropriately. The test and standard drugs were given orally (tabulated in table-4). After 30 minutes, the animals are placed in the Rota-rod for a minimum of 3 mins and the observations/counts were recorded as the fall off time within those 3 mins. This observation was repeated for interval of 60, 90, 120 and 180 minutes. The result of depressant activity in mice was tabulated in Table-5, 6

Statistical Analysis

Allthe results were expressedas mean±SEM and subjectedtooneway analysisofvariancefollowed by Dunnet's t- test for comparison between the groups. In all the cases $p<0.05$ was considered statistically significant.

RESULTS AND DISCUSSION

Actophotometer method

Group B received chlorpromazine (4 mg/kg) and it has showed significant CNS depressant

activity by decrease in basal activity score at 90 min

Group C was treated with *Allmania nodiflora* (L.) R.Br. ex Wight(250 mg) and has showed significant CNS depressant activity when compared to control where as other groups, like group D and group E were treated with *Euphorbia hirta* and combination of *Allmania nodiflora* (L.) R.Br. ex Wightand *Euphorbia hirta respectively* have also shown significant CNS depressant activities.

Rotarod method

Group B received diazepam (2.8 mg/kg) and it has showed significant CNS depressant activity by decrease in basal activity score at 30 min while maximum decrease is observed in 90 mins.

Group C was treated with *Allmania nodiflora* (L.) R.Br. ex Wight(250 mg) and has showed significant CNS depressant activity when compared to control where as other groups, group D and group E were treated with *Euphorbia hirta* and combination of *Allmania nodiflora* (L.) R.Br. ex Wightand *Euphorbia hirta respectively*and have also shown significant CNS depressant activities.

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Table 1: Acute toxicity studies of *Allmania nodiflora* (L.) R.Br. ex Wight

S. No	Group	No. of animals / group	Dose mg/kg	No. of deaths of animals
1	V	3	5	0
2	VI	3	50	0
3	VII	3	300	0
4	VIII	3	2000	0

Table 2: Acute toxicity studies of *Euphorbia hirta*

S. No	Group	No. of animals / group	Dose mg/kg	No. of deaths of animals
1	I	3	5	0
2	II	3	50	0
3	III	3	300	0
4	IV	3	2000	0

Group classification

Table 3: treatment given to groups

S.No	GROUPS	Treatment
1	GROUP A	Received 1% Sodium CMC, Served as Control
2	GROUP B	Received Standard drug Chlorpromazine at a dose 4mg/kg
3	GROUP C	Received Ethanolic extract of *Allmania nodiflora* (L.) 200mg/kg
4	GROUP D	Received Ethanolic extract of *Euphorbia hirta*200mg/kg
5	GROUP E	Received Ethanolic extract of*Allmania nodiflora* (L.) 125 mg/kg + *Euphorbia hirta*125 mg /kg

Table 4: CNS depressant activity of *Allmania nodiflora*(L.) R.Br. ex Wight and *Euphorbia hirta* by using Actophotometer

Time	Control	Standard	AN	EH	AN+EH
0	76	82	72	74	79
30	64	35	53	49	50
60	70	10	41	36	42
90	78	5	32	21	23
120	68	5	34	24	28
180	80	5	40	38	41

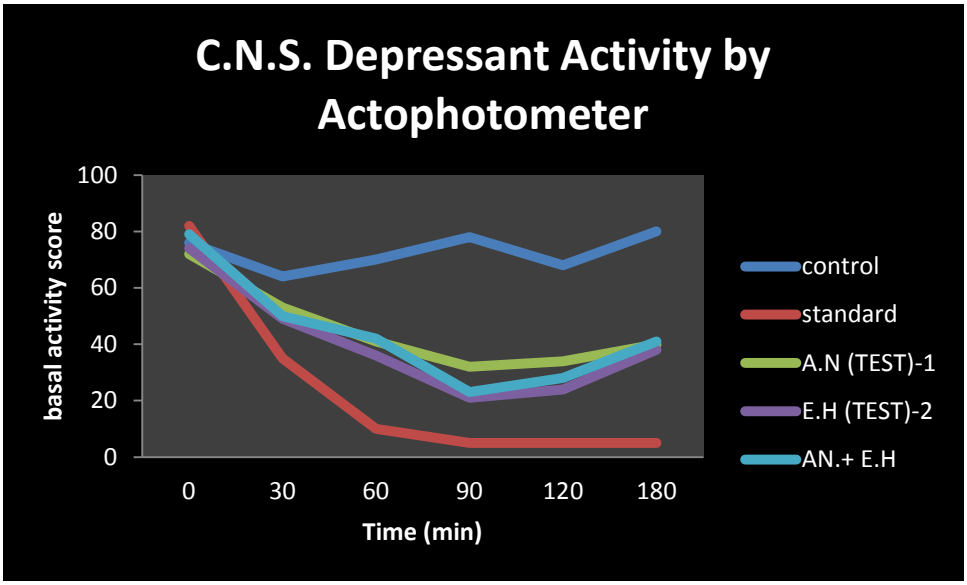

Fig. 1: Central nervous system depressant activity by using Actophotometer

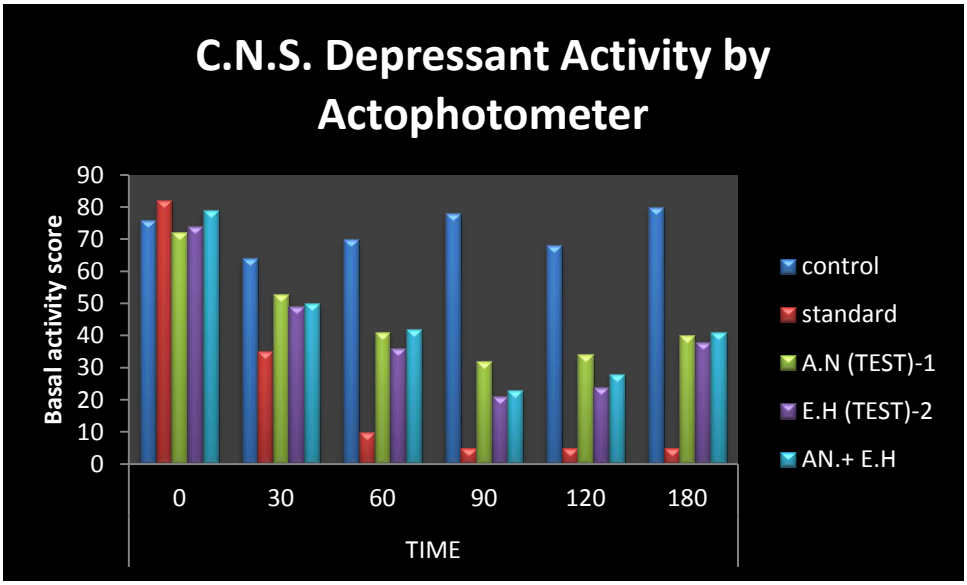

Fig. 2: Central nervous system depressant activity by using Actophotometer

Table 5: Central nervous system depressant activity by using Actophotometer

Sl.No	GROUPS	TREATMENTS	Mean ±SEM
1.	Group A	Control	71.83 ± 2.365
2.	Group B	Standard Chlorpromazine (4 mg/kg)	23.66 ± 11.50
3.	Group C	*Allmanianodiflora* (200 mg/kg)	45.33 ± 5.58
4.	Group D	Euphorbia hirta (200 mg/kg)	40.33 ± 7.20
5.	Group E	Combination of AN+EH (125 mg/kg + 125 mg/kg)	43.83 ± 7.398

Values are expressed asMean ± SEM, n=6

Group classification

Table 6: treatment given to groups

S.No	GROUPS	Treatment
1	GROUP A	Received 1% Sodium CMC, Served as Control
2	GROUP B	Received Standard drug Diazepam at a dose 2.8 mg/kg
3	GROUP C	Received Ethanolic extract of *Allmanianodiflora*200mg/kg
4	GROUP D	Received Ethanolic extract of *Euphorbia hirta*200mg/kg
5	GROUP E	Received Ethanolicextract of *Allmanianodiflora* 125 mg/kg + *Euphorbia hirta*125 mg /kg

Table 7: CNS depressant activity of*Allmanianodiflora* and *Euphorbia hirta* by using Rota-rod

Time	Control	Standard	AN	EH	AN+EH
0	175	180	162	190	180
30	168	16	32	25	21
60	172	8	25	13	15
90	180	5	20	11	10
120	175	9	22	20	19
180	163	14	43	35	28

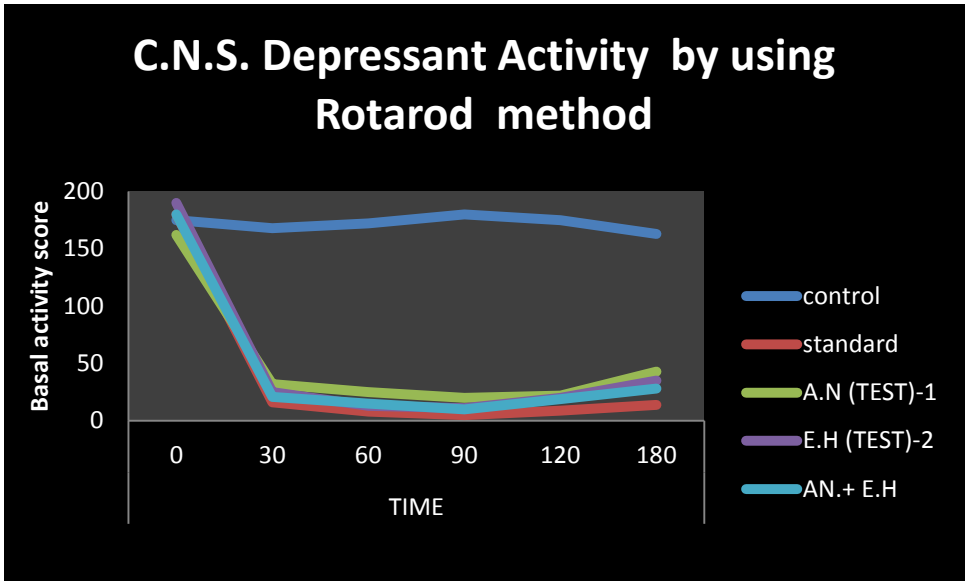

Fig. 3: CNS Depressant activity by using Rota-rod

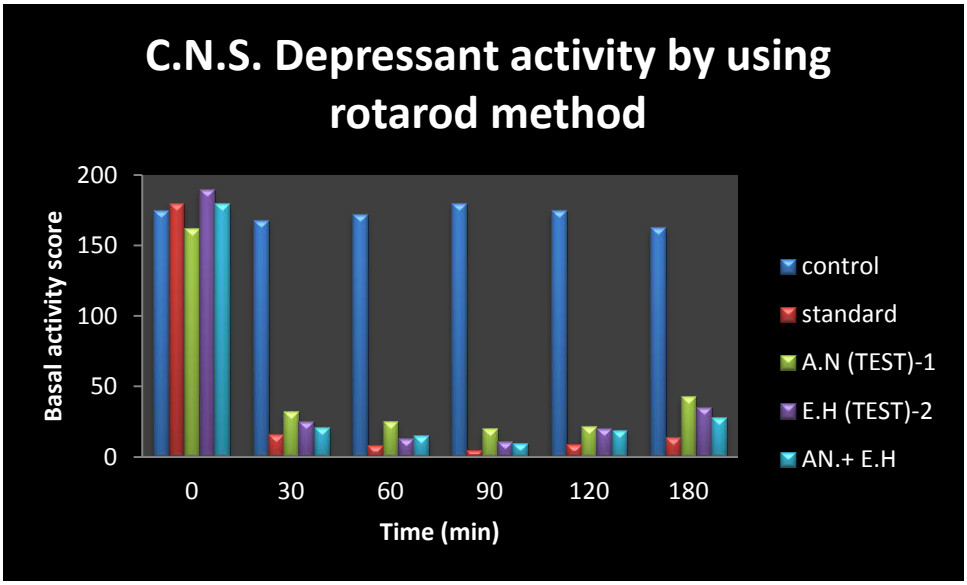

Fig. 4: CNS Depressant activity by using Rota-rod

Table 8: Central nervous system depressant activity using Rota-rod

Sl.No	GROUPS	TREATMENTS	Mean ±SEM
1.	Group A	Control	172.166 ± 2.22
2.	Group B	Standard Diazepam (2.8 mg/kg)	38.66 ± 25.847
3.	Group C	Allmanianodiflora (200 mg/kg)	50.66 ± 20.563
4.	Group D	Euphorbia hirta (200 mg/kg)	49 ± 25.945
5.	Group E	Combination of AN+EH (125 mg/kg + 125 mg/kg)	45.5 ± 24.65

Values are expressed asMean ± SEM, n=6

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