ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Evaluation of Anti-Catatonic Effect of Leaf Extracts of *Tragia plukenetti R.Smith* on Phenothiazine Induced Catatonia in Rats.

Sathish Kumar M*, Farzana SK, and Ramarao Nadendla

Department of Pharmacology, Chalapathi Institute of Pharmaceutical Sciences, Guntur

ABSTRACT

The study was undertaken to evaluate the anti-catatonic effects of *Tragia plukenetii R. Smith* methanolic leaf extracts using phenothiazine induced catatonia in rats. Catatonia was produced by the administration of phenothiazine in Wistar rats. The study comprised of three treatment groups (Control, Standard and Test - *Tragia plukenetii* methanolic leaf extract) all with five animals in each group. Severity of catatonia was observed and scored. At the end of the study the test treated (*TP*ME) group showed significant anticatatonic effect, showing an overall p value <0.0001 when compared with other treatment groups i.e., control and standard.

Key words: *Tragia plukenetii,* Euphorbiaceae, Catatonia, Phenothiazine, Anti-parkinsonian

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Idiopathic Parkinson's disease (IPD) has highly characteristic neuropathological findings and clinical presentation including motor deficits and in some cases, mental deterioration. Parkinson's disease is progressive mortality disorder, it occurs due to loss of dopaminergic neurons running from substantia nigra to corpus striatum [1]. These dopaminergic neurons are inhibitory neurons that act on D2 receptor of cholinergic neurons in the corpus striatum, thus loss of inhibition causes hyperactivity of these cholinergic neurons [2]. The cause of parkinson's disease is unknown for most patients. It can be characterized by tremors, muscular rigidity, bradykinesia (slowness in initiating and carrying out voluntary movements [3].

Catatonia is only identified as symptom of Parkinson's, it may experience an extreme loss of motor skill or even constant motor activity. The symptom most clearly related to dopamine deficiency, which occurs immediately and invariably in lesioned animals. In experimental lesions two secondary consequences follow damage to the nigrostriatal tract, viz, a hyperactivity of the remaining dopaminergic neurons, which show an increased rate of transmitter turnover, and an increase in the number of dopamine receptors which produces a state of denervation hypersensitivity.

PHENOTHIAZINE INDUCED CATATONIA:

Phenothiazine is a type of antipsychotic drug is known to produce extrapyramidal side effects in man. These effects, such as akinesia, rigidity and tremors, are called Parkinson's-like because in Parkinson's disease the major clinical symptoms include difficulty to move and change posture (akinesia and rigidity) and tremors. These effects of antipsychotic drugs are due to excessive blockade of dopamine receptors in the extrapyramidal motor system. Therefore, phenothiazines (chlorpromazine or perphenazine) are commonly used to produce Parkinson's-like extrapyramidal symptoms in laboratory animals and to study anti-parkinsonian drugs [4-7].

EXPERIMENTAL ANIMALS:

Wistar rats of either sex (200-300g) were maintained for 7 days in the animal house of Chalapathi Institute of Pharmaceutical Sciences, Guntur under standard conditions temperature (24 ± 10 C), relative humidity (45-55%) and 12:12 light: dark cycle. The animals were fed with standard rat pellet and water ad libitum. The animals were allowed to acclimatize to laboratory conditions 48 h before the start of the experiment. 5 rats/group were used in all sets of experiments. All the experiments were conducted after obtaining permission from the Institutional Animal Ethics Committee (IAEC) Chalapathi Institute of Pharmaceutical Sciences, Guntur.

SELECTION OF DOSE AND TREATMENT PERIOD:

The anti-parkinsonian activity of the methanolic leaf extracts of *Tragia plukenetii R. Smith* was investigated using the phenothiazine induced catatonia method. The test animals were randomly chosen and divided into three groups having five rats in each as follows: Group-1- Control group (0.9% Normal saline 5ml/kg i.p), Group-2 – Standard (Amantidine - 10mg/kg ip), Group-3 – Test (Methanolic leaf extract of *Tragia plukenetii [TPME]* - 100mg kg i.p). All the treatment group animals received respective control, standard and test treatment 30 minutes prior to the phenothiazine (Dose: 5mg/kg ip - 0.5 ml/100g bodyweight of the animal) administration. Severity of catatonic response was recorded as follows:

Stage I: Rat moves normally when placed on the table, score=0.

Stage II: Rat moves only when touched or pushed, score=0.5.

Stage III: Rat placed on the table with front paws set alternatively on 3cm high block fails to correct the posture in 10 sec, score=0.5 for each paw with a total of 1 for this stage.

Stage IV: Rat fails to remove when the front paws are placed alternatively on 9cm block, score= 1 for each paw a total score of 2 for this stage.

Thus for a single rat, the maximum possible score would be 3.5 revealing total catatonia.
Severity of catatonia was observed at 15, 30,45,60,90 min after phenothiazine administration.

STATISTICAL ANALYSIS:

The values are expressed as mean± SEM. The results were analyzed for statistical significance using ANOVA followed by Dunnett's multiple comparison test.

RESULTS AND DISCUSSION

Tragia plukenetii is neglected because of its stinging hairs characters but it contains minor flavonoids like sulphuretin, butein and naringin. These flavonoids widely used in medicine because they show antiviral activities and antioxidant properties and also an important a potent inducer of nodulation gene in plants. So this stinging hairs plant is also source of the minor flavonoids [8-12]. The test treated (TPME) group has showed significant anticatatonic effect, showing an overall p value <0.0001 when compared with other treated groups i.e., control and standard (Table No: 1, Fig No: 1).

ISSN: 0975-8585

Table 1: Anti-catatonic effect of *Tragia plukenetii* leaf extract

S.NO.	GROUP	TREATMENT	MEAN± SEM				
			15	30	45	60	90
1.	I	Control	0.30±0.12	1.30±0.12	2.90±0.24	3.50±0.0	3.5±0.0
2.	II	Standard+ Phenothiazine	0.10±0.10	0.40±0.18	0.20±0.12	0.0±0.0	0.0±0.0
3.	III	TPME+ Phenothiazine	0.20±0.12	0.70±0.12	0.30±0.12	0.30±0.20	0.0±0.0

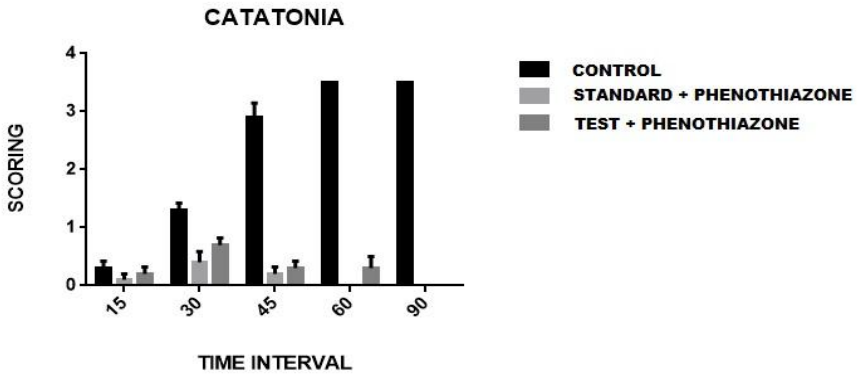

Figure 1: Anticatatonic effect of *Tragia plukenetii* leaf extract

CONCLUSION

The methanolic leaf *Tragia plukenetii R. Smith* showed anti-catatonic activity when compared with the other treatment groups and therefore has the potential of being used in the treatment of Parkinson's disease.

REFERENCES

[1] Humphrey P, Rang Maureen M, Dale James M, Ritter Rod J, Flower Graeme Henderson. Rang & Dale's Pharmacology, 7th Edition. Churchill Livingstone.
[2] Barbara Wells, Joseph DiPiro, Terry Schwinghammer, Cecily DiPiro. Pharmacotherapy Handbook, 8th Edition. The McGraw Hills Companies, Inc.
[3] Richard A, Harvey Pamela C Champe. Lippincott's Illustrated Reviews: Pharmacology, 4th Edition. Lippincott Williams & Wilkins.
[4] Kulkarni SK, Arzi and Kaul PN. Japan J Pharmacol 1980; 30: 129-135.
[5] Dandiya PC, Bhargava LP. Arch Int Pharmacdyn Therp 1968; 176: 157-167.
[6] Ther L, Vogel G, Werner Ph. Arzneim Forsch/Drug Res 1959; 9:351–354.
[7] Costal B, Naylor RJ. Psychopharmacology 1974; 34: 233-241.

[8] M Sathish Kumar, D Eswar Tony, N Rama Rao. Res J Pharm Biol Chem Sci 2013; 4(2): 1363-1366.
[9] M Kalaivanan, L Louis Jesudass. IOSR Journal of Pharmacy 2012; 2(6): 1-7.
[10] Meenakshi Sundaram Muthuraman, Sudarsanam Dorairaj, Parthasarathy Rangarajan, Brindha Pemaiah. African Journal of Biotechnology 2008; 7 (20): 3527-3530.
[11] A Leo Stanley, A Charles, V Alex Ramani, A Ramachandran. Journal of Pharmacy Research 2012; 5(3):1701-1703.
[12] VT Narwade, AA Waghmare, AL Vaidya. International Multidisciplinary Research Journal 2012; 2(3):51-52.