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Evaluation of Anti Catatonic Effect of *Moringa Oleifera* Extract by Haloperidol Induced Catatonia in Rats

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Abstract **Original Research Article**

The present investigation was attempted to assess the anti-catatonic activity of methanolic and watery concentrates of Moringa Oleifera on haloperidol actuated catatonia in rodents. The examination includes five gatherings (Negative control, positive control, standard, watery stem extract, methanolic stem extricate), each containing five animals. Animals in gatherings I, III and V were directed with haloperidol to deliver extra pyramidal symptoms. The seriousness of the catatonia was assessed by square strategy and is scored. The methanolic and watery concentrates of Moringa Oleifera have indicated huge anti-catatonic impact at a portion of 100mg/kg,p.o., demonstrating a general p value <0.05 when contrasted with different gatherings. Methanolic concentrate has greater capacity to decrease the extra pyramidal impacts than watery concentrate. The outcomes recommend that both the concentrates can be utilized for anti-catatonic activity.

Keywords: *Moringa Oleifera*, anti-catatonic, haloperidol induced catatonia, block method.

INTRODUCTION

Parkinson'sdisease (PD) is a long haul degenerative issue of the focal sensory system that predominantly influences the motor system. It is a dynamic mortality issue, happens because of loss of dopaminergic neurons running from substantia nigra to corpus striatum. These dopaminergic neurons are inhibitory neurons that follow up on D2 receptor of cholinergic neurons in the corpus striatum, in this way loss of restraint causes hyperactivity of these cholinergic neurons [1]. Use of run of the antipsychotics medications like phenothiazine (chlorpromazine or perphenazine), haloperidol or non-insane medications, for example, steroids, disulfiram, ciprofloxacin, a few benzodiazepines, just as medications of maltreatment, including phencyclidine, cannabis, mescaline, LSD, cocaine will create extra pyramidal reactions (mental side effects) like tremors, solid unbending nature and bradykinesia [2].

The major clinical side effect of Parkinson's sickness incorporates trouble to move and change the stance (akinesia and unbending nature) and tremors. So by this parameter we could watch the seriousness of catatonia. Haloperidol instigated catalepsy i.e., a condition of akinesia with strong inflexibility of muscles in animals, is one of the built up model for screening the medications for antiparkinson's impact [3].

Moringa Oleifera (Family: Moringaceae), prominently known as Mulaga. Moringa oleifera Lam is a little sort of speedy developing trees appropriated in India, Arabica, Asia Minor and Africa. This tree is indigenous to northwest India. It is broadly developed and naturalized in tropical Africa, tropical America, Sri Lanka, Maxico, Malabar, Malaysia and the Philippine islands. The leaves are utilized to separate the incidental materials from body tissues without surgery [4]. Leaves are bubbled and taken two times per day for stomach hurts. The roots are utilized in the treatment of testicular development and in the fix of edema. The entire plant is utilized for the fix of malignant growth in the bottom of the foot. It is likewise utilized in the treatment of stomach knots and liver hypertrophy and entryway hypertension. The bark of stem is utilized for tooth ache [5].

Fig-1: Image of *Moringa Oleifera*

Phytochemicals

The aqueous & methanolic stem extracts of *Moringa Oleifera* possess the following chemical constituents.

Table-1: Phytochemicals present

S. No.	Phytoconstitutents	Methanolic extract	Aqueous extract
1	**Alkaloids**	+	+
2	**Unsaturated sterols**	+	+
3	**Saponins**	+	-
4	**Glycosides**	+	+
5	**Phenolics**	+	+
6	**Terpenoids**	+	+
7	**Tannins**	+	+
8	**Flavonoids**	+	+
9	**Carbohydrates**	+	+
10	**Proteins**	+	+

'+' indicates presence of phytochemicals; '-'indicates absence of phytochemicals

MATERIALS AND METHODS

The stem of Moringa Oleifera was shade dried and was powdered in a mechanical processor. The gathered powder was removed with water &methanol by utilizing Soxhlet apparatus. The extraction was done for 72 hrs. Overabundance dissolvable was evacuated by the de-salvation.

Haloperidol Induced Catatonia in SD Rats:

Haloperidol {4-(4-chlorophenyl)- 1-(4-(4-flurophenyl)- 4-oxobutyl)- 4-piperidinol} is the generally utilized antipsychotic medication and it imparts some auxiliary likeness to 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP). MPTP is distinguished as the poisonous specialist present in heroin and in charge of neurodegenerative condition like Parkinson's ailment. MPTP is generally used to actuate Parkinsonism in trial animals. Haloperidol is processed in liver, it experiences oxidation to the pyridinium metabolite, 4-(4-chlorophenyl)- 1-(4-(4-fluorophenyl)- 4-oxobutyl)- pyridinium (HPP+) which offers some auxiliary similitude and harmful activities with pyridinium metabolite of MPTP 1-methyl-4-phenylpyridine (MPP+). This recommends HPP+ may create neurological impacts like MPTP. In this manner, in the present examination haloperidol is utilized to initiate Parkinsonism in rodents.

Haloperidol is known to deliver extrapyramidal reactions in man. These impacts, for example, akinesia, rigidity and tremors, are called Parkinson's-like in light of the fact that in Parkinson's illness the major clinical manifestations incorporate trouble to move and change pose (akinesia and rigidity) and tremors. These impacts of antipsychotic medications are because of extreme blockade of dopamine receptors in the extrapyramidal motor framework. In this way, butyrophenones [haloperidol (or) trifluperidol] are normally used to deliver Parkinson's-like extrapyramidal manifestations in research animals and to examine hostile to parkinsonian drugs [6].

Experimental Design

The counter parkinsonism movement of the fluid and methanolic concentrates of Moringa Oleifera was researched utilizing the haloperidol instigated catatonia strategy [Haloperidol is broadly used to actuate Parkinsonism like condition at a portion of 0.5 to 4 mg/kg day by day for seven days in rats]. The

guinea pigs were arbitrarily picked and isolated into four gatherings having five rats in each as pursues:

Treatment Schedule of Different Groups

1. **Group I (Negative Control)**: Haloperidol (4mg/kg, p.o once/day x 1 week)
2. **Group II (Positive Control)**: Saline solution (0.9%,)
3. **Group III (Standard)**: Syndopa plus [(Levodopa+ carbidopa) (10mg/kg, p.o, once/day x 1 week)] +Haloperidol [7].
4. **Group IV (Test I)**: Aqueous extract of *Moringa Oleifera* [AEMO- 100mg/kg p.o x 1 week] +Haloperidol
5. **Group V (Test II)**: Methanolic extract of *Moringa Oleifera* [MEMO- 100mg/kg p.o x 1 week] +Haloperidol

Every one of the animals of the gatherings were treated with particular medications 30 minutes preceding haloperidol administration for 7 days of experimental period.

EVALUATION OF ANTIPARKINSON ACTIVITY

Measurement of Catalepsy by Block Method:

Two wooden squares were taken. One is 3cm high and the other is 9cm high. Catalepsy of rat was estimated by a scoring strategy given below [8-10]. Seriousness of mental reaction was recorded as pursues:

Table-2: Scoring For Catatonia

Stages	Description/Behavior	Score
Stage- I	Rat moves typically when placed on the table	0
Stage- II	Rat moves **just** when touched or pushed	0.5
Stage –III	Rat placed on the table with front paws set on the other hand 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.	1
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.	2

In this manner for a solitary rat, the most extreme conceivable score would be 3.5 uncovering complete catatonia. Seriousness of mental shock was seen at 30, 60, 90,120 and 240 min after haloperidol administration. Plot a chart, time along on X-axis and catatonic scores along the Y-axis.

Fig-2: Catatonia-Stage-III

Fig-3: Catatonia-Stage-IV

STATISTICAL ANALYSIS

The results are depicted as mean ± S.E.M, and measurable significance among treated and control groups was investigated utilizing of ANOVA.

RESULTS AND DISCUSSION

Impact of stem concentrates of Moringa Oleifera on cataleptic activity

Haloperidol induced a period dependent increment in cataleptic state in rats, when contrasted with vehicle treated gatherings. Most extreme catalepsy score was noted at a time interim of 120-180 min. every one of the groups for example standard (L-dopa + carbidopa), MEMO and AEMO demonstrated critical ($P<0.05$) decrease in scores at all time periods. The normal scores for the standard and the test medications were diminished to that of the Haloperidol group (Group I).

Table-3: Effect of fruit extracts of *Moringa Oleifera* on haloperidol-induced Parkinsonism (catalepsy)

S. No	Group	Treatment	Degree of catatonic response(in min)				
			30	60	90	120	240
1.	I	Haloperidol	0.66±0.07	1.83±0.09	2.81±0.08	3.54±0.06	2.80±0.20
2.	III	Standard + haloperidol	0.32±0.02	0.50±0.02	0.33±0.02	0.27±0.02	0.32±0.01
3.	IV	AEMO + haloperidol	0.34±0.02	0.52±0.02	0.34±0.02	0.25±0.02	0.32±0.01
4.	V	MEAO + haloperidol	0.33±0.02	0.51±0.02	0.33±0.02	0.24±0.02	0.32±0.02

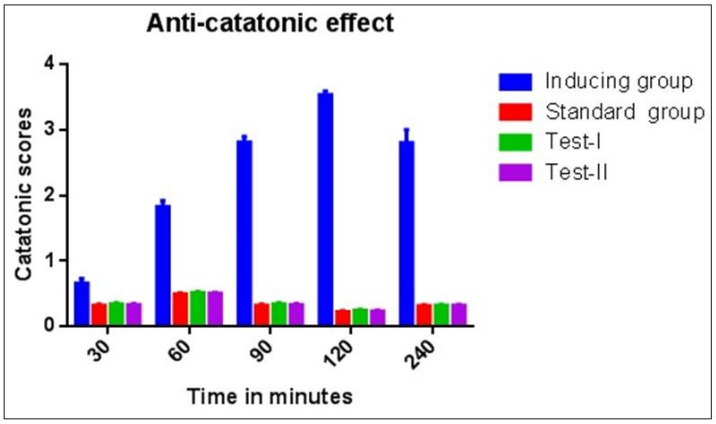

Fig-4: Effect of stem extracts of *Moringa Oleifera* on haloperidol-induced Parkinsonism (catalepsy).Values are expressed as Mean ± SE, *p* < *0.05* vs. control (n = 5 animals)

CONCLUSION

Pharmacological screening of methanolic and fluid concentrates of Moringa Oleifera demonstrated anti-catatonic action. The methanolic concentrate was found to have a decent action than watery concentrate and can possibly be utilized as hostile to catatonic. The substance constituents like saponins and flavonoids in Moringa Oleifera gives an expectation for further investigate in the zone of neurodegeneration.

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