Research Article

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ANTIPSYCHOTIC ACTIVITY ON HYDROETHANOLIC EXTRACT OF LEAVES OF *CITRUS LIMON* LINN.

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ABSTRACT

The present work is designed to evaluate the antipsychotic activity of hydroethanolic extract of the leaves of *Citrus limon* Linn. using Open Field Locomotors Test (OFLT) model in Swiss albino mice. Albino mice were treated with different doses of the extracts (i.e.100 and 200 mg/kg orally) and behavior was observed on the OFLT. Results showed that hydroethanolic extract at the dose level 100 and 200 mg/kg of the leaves of *Citrus limon* Linn. markedly decreased the number of locomotion and rearing in the OFLT.

Keywords: Antipsychotic, *Citrus limon* Linn, Open field locomotors test.

INTRODUCTION

As indicated by the World Health report[1], roughly 450 million individuals experienced behavioral issue, yet just a little minority of them got even the most essential treatment. This adds up to 12.3% of the worldwide weight of illness, and will ascend to 15% by 2020[2]. In the look for new remedial items for the treatment of neurological issue, restorative plant examine, around the world, has advanced continually, showing the pharmacological adequacy of various plant species in an assortment of animal models[3]. Psychosis is a side effect of emotional sickness portrayed by a radical change in identity and a mutilated or decreased feeling of target reality[4].

Psychosis shows up as a manifestation of various mental issues, including inclination and identity issue, schizophrenia, preposterous confusion and substance mishandle. It is additionally the characterizing highlight of the insane issue (i.e., brief maniacal issue, shared crazy issue because of a general therapeutic condition, and substance-incited insane confusion). Patients experiencing psychosis can't recognize the genuine from the unreal[5]. They encounter mental trips as well as hallucinations that they accept are genuine, and they ordinarily carry on in an unseemly and confounded way. It has lead researchers to explore plants, which are normally utilized in conventional and interchange arrangement of pharmaceutical for psychotic disorders and related diseases[6].

Now a days several plants are being used as alternative medicine for management of psychosis. Citrus fragrances have been particularly attributed with mood enhancing properties by aroma therapists. Volatile oils isolated from grapefruit (*Citrus paradisi*), bergamot (*Citrus bergamia*), lime (*Citrus aurantifolia*), mandarin (*Citrus nobilis*) and orange (*Citrus aurantium*) are regularly utilized as a part of the treatment of depression[7, 13]. A literature review revealed that *Citrus limon* is one of the widely used plant employed in herbal medicine and aromatherapy[8]; However, no significant work has been initiated on the psychotic effects of the plant extracts. Henceforth, the present examination was intended to assess the anti psychotic activity of leaves extract of *Citrus limon.*

MATERIALS AND METHODS

Plant material

The leaves of *Citrus limon* were procured and plants samples were identified and further confirmed by matching with the samples in the LWG herbarium of the National Botanical Research Institute, Lucknow, Reference no. 97847**.**

Preparation of extracts

Leaves of *Citrus limon* Linn. were washed and dried in shade and powdered. The powdered leaves (500g) were dissolved in 500 ml of hydroethanol in a conical flask. The mixture was shaken vigorously for 6 hours and allowed to stand for 18 hours. It was then filtered with Whatman filter paper (No.1) and the filtrate was evaporated at 50^{o} C in a rotavapour. After that it was lyophilized in a freeze lyophilizer[9].

Test animals

The experimental animals [Swiss albino mice (20 - 25 gm) of either sex] were procured from the Animal House, Saroj Institute of Technology and Management, Lucknow. The animals were given standard laboratory feed and water. The experiments were performed between 8.00 am to 1.00 pm. The experiments were conducted in a sound proof laboratory. All the experimental procedures and protocols used in the study were reviewed by the Institutional Animal Ethics Committee.

Open field locomotor test (OFLT)

The OFLT area was made of acrylic (transparent walls and black floor, 30cm x 30cm x 20 cm) divided into nine squares of equal area. The OFLT was used to evaluate the animal's exploratory activity. The observed parameters were: number of squares crossed (with the four paws) during three minutes after one minute for acclimatization (loco motor activity) and number of rearing[10].

Treatments

The animals were divided into four groups of 6 animals each. All the four groups were treated with amphetamine to induce psychosis at the dose of 2mg/mice i.p. The mice in third and fourth group were treated with hydro ethanolic extract (100mg & 200mg; p.o) and the reference drug chlorpromazine (2mg/kg; i.p.) respectively 30 min post amphetamine administration. The first group served as the control and received 0.5% CMC suspended in distilled water and both the i.p. dose received normal saline suspended in distilled water[11].

Table 1: Anti-psychotic activity of hydro alcoholic extract of leaves of *Citrus limon* Linn. in open field locomotor model

Groups	Treatments	Locomotor activity	
		No. of crossings (Avg±SEM)	No. of rearings (Avg±SEM)
1.	Control (0.5% CMC)	49.5±0.304	25.6±0.280
2.	Std. Chlorpromazine(2mg/ kg)	8.5±0.390	5.3±0.192
3.	100 (mg/kg)	23.67±0.380*	13±0.333*
4.	200 (mg/kg)	19±0.333*	8.5±0.204*

Each value represents the mean ± SEM (n=6), significant levels* P < 0.01 as compared with respective control (Turkey's Test).

Statistical analysis

The Psychotic activities of the extracts, Chlorpromazine and control were analyzed by one way analysis of variance (ANOVA). The test groups were compared with standard/control by students t-Test. Difference were considered significant at $p<0.05$[12].

RESULT

The results obtained from the OFLT model, indicates that hydroethanolic extract showed significant ($p<0.05$) anti psychotic activity as compared to chlorpromazine. The no. of crossings was increased by control (amphetamine) (49.5±0.304; 25.6±0.280) and significantly decreased by chlorpromazine (8.5±0.390; 5.3±0.192). The leaves of *Citrus limon* Linn. indicated a significant decrease ($P<0.05$) in locomotion no. and no. of rearing at different doses 100 mg/kg of leaves of *Citrus limon* extracts (23.67±0.380; 13±0.333) and 200 mg/ kg (19±0.333; 8.5±0.204) comparable to reference drug, Chlorpromazine (2mg/kg) and result are shown in Table 1, Figure 1 and 2; the observation and the statistical analysis shows the positive effect of the extract of the leaves of *Citrus limon* Linn. in the stage of psychosis.

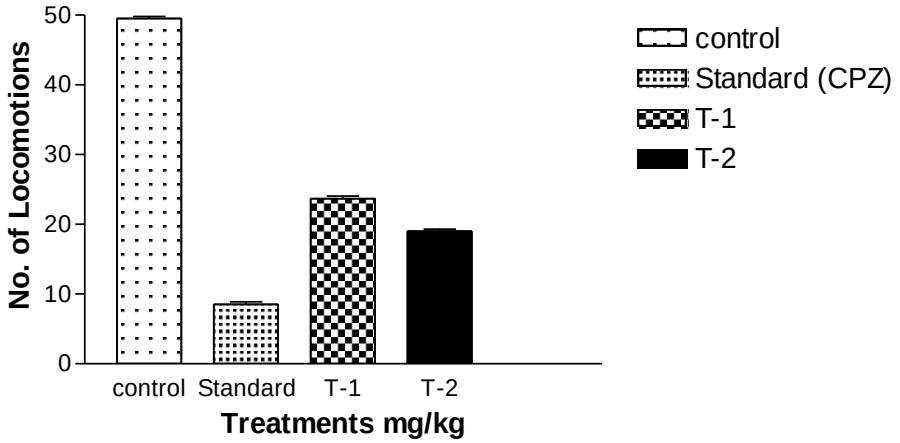

Figure1: Graphical representation of observed parameter for various treatment groups Open Field Locomotor test (No. of squares crossed)

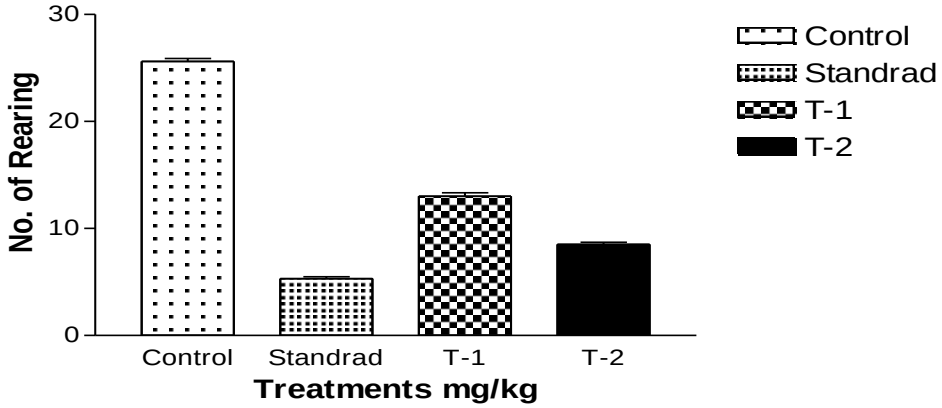

Figure 2: Graphical representation of observed parameter for various treatment groups Open Field Locomotor test (No. of rearing).

CONCLUSION

The leaves of *Citrus limon* Linn. indicated a significant decrease ($P<0.01$) in locomotion no. and no. of rearing at different doses 100 and 200 mg/kg of leaves of *Citrus limon* extracts, comparable to reference drug, Chlorpromazine (2mg/kg) and result showed in Table 1 and Figure 1 and 2 the observation and the statistical analysis shows the positive effect of the extract of the leaves of *Citrus limon* Linn. in the stage of psychosis. The result of the study justified the use of extract of *Citrus limon* Linn. leaves as antipsychotic agent. Thus, the extract can be a key contributor in home based formulation in the treatment of psychosis. This is contributed by the fact that the plant is versatile and is able to grow in all climate and seasons throughout the country and easily identifiable.

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