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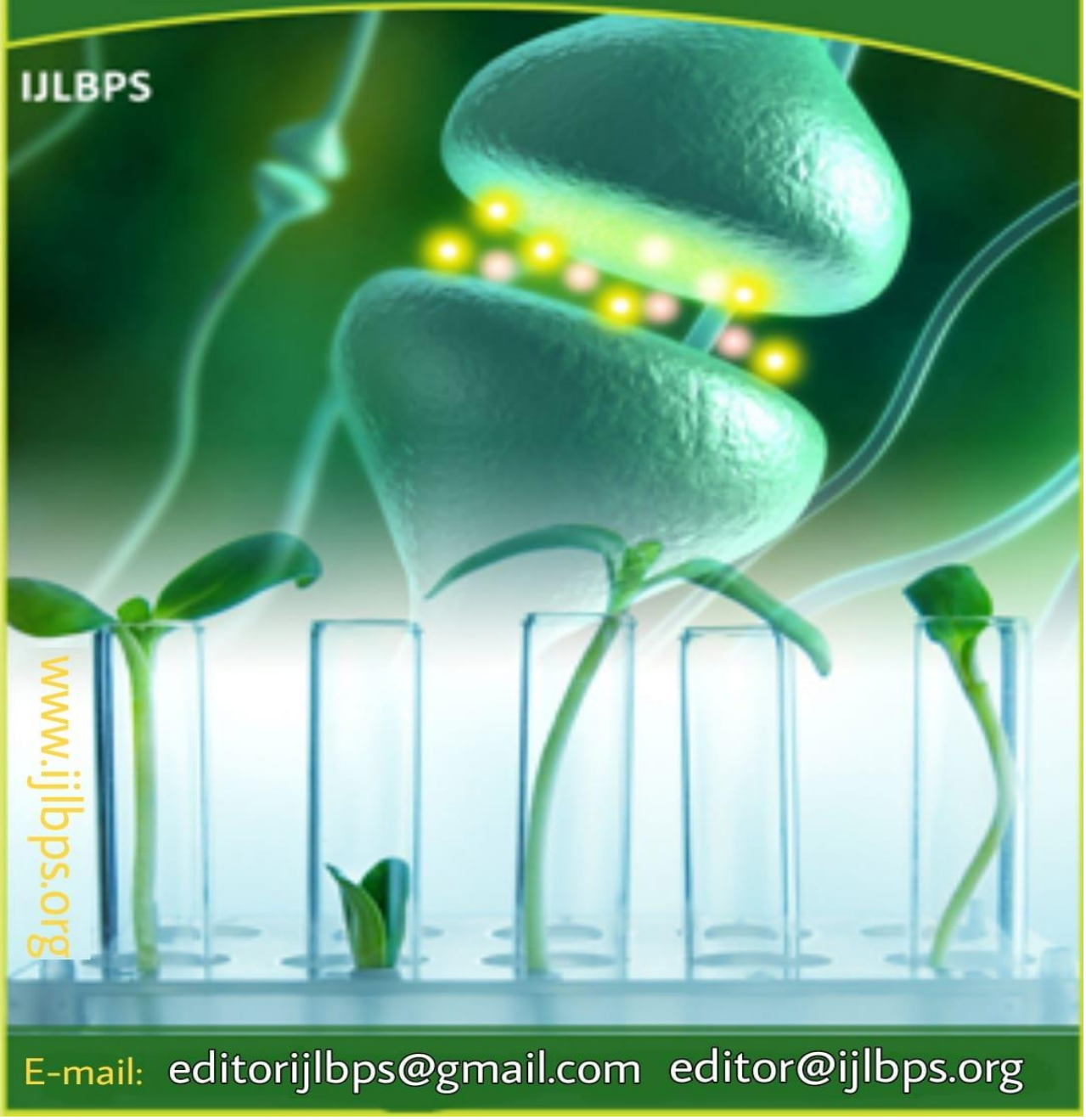

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The ethanolic extract of Ipomea mauritiana leaves has an antianxiety effect in swiss albino mice

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Abstract

This abstract discusses Ipomea mauritiana, sometimes known as large potato, a plant in the convolvulaceae family. The goal of this study was to ascertain whether swiss albino mice would benefit from taking an ethanol extract of Ipomea mauritiana leaf for its potential antianxiety properties. There were a total of six swiss albino mice used, with group I receiving saline and group II receiving diazepam. Groups III and IV were administered 200 mg/kg and 400 mg/kg of ipomea mauritiana orally. The elevated plus maze (EPM) and light and dark model were used to assess the efficacy of anti-anxiety drugs. Anxiety was reduced in mice given the ethanolic extract. The possibility that Ipomea mauritiana might be utilized to treat anxiety is strengthened by these findings. More research is needed to identify the active chemical causing the effect.

Concern, Ethanol extract, the Elevated Plus Maze, and Ipomea mauritiana are some of the keywords here.

INTRODUCTION

Anxiety is an uncomfortable emotional state, negative feelings about the future, or distress that triggers a sense of defense that warns the individual to prepare to face a potentially dangerous situation, and it is a psychological and physiological state characterized by somatic, emotional, cognitive, and behavioral components. Nearly 25% of the adult population will suffer from anxiety disorders, a mental illness. Anxiety disorders are more common in women (30.5%) than in males (19.2%). A common occurrence treatment. Worry may make a bad situation more worse, both physically and mentally, and it can down the healing process. One-eighth of the global population experiences anxiety, making it a major focus of psychopharmacological research in this decade.For thousands of years, people have relied on traditional medicine based on the knowledge that some plants have healing powers. Traditional remedies are utilized worldwide since modern pharmaceuticals have so many unwanted side effects and are so expensive. Medicines made from plants have always been an integral part of human culture.

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alarmingly high rate of anxiety disorders u kids today.Less than one-fifth of those with these types of mental problems reportedly get treatment, according to a recent study.

The giant potato (Ipomea mauritiana) is a member of the convolvulaceae family and may be found naturally occurring in many tropical regions. Usually palmately 5-7 split to or beyond center, rarely entire or slightly lobed; stems may reach 10 meters in length; leaf blade is round in form, 7-18 x 7-22 cm. 5-6-petaled, pink or reddish-purple flowers with a darker, funnel-shaped core. This plant's tubers contain antioxidant and immunomodulatory activities33 and are used for a variety of medical purposes. They are tonic, alterative, aphrodisiac, galactogogue, demulcent lactagogue, purgative, cholagogue, and more. Milk production, liver and spleen enlargement, increased body mass, menstrual flow moderation, digestive issues including menorrhagia, weakness, and fat buildup are among conditions for which this herb is prescribed.The beta-sitosterol and taraxerol acetate found in the tiglic rhizome are the plant's active ingredients. Quinolinic acid A and operculinic acid, as well as the glycosidic acids ergonovine, isobutyric(S)-2methylbutyric, n-decanoic, n-dodecanoic, cinnamic, and tto. Alkaloids, flavonoids, tannins, gums, sugars, phenols, and glycosides are the most abundant phytochemicals in Ipomea mauritiana leaves.

Material and Methods

Plant material

Leaves of *Ipomea mauritiana* were collected from Star square, Indore (M.P.) India. And when authentication by Dr. S. N. Dwivedi, Prof. and Head, Department of Botany, janata PG College, APS, University, Rewa (M.P.),India.

Treatment of plant part

The leaves of the plant were cleaned, dried undershade and powdered by a mechanical grinder.

Preparation of ethanolic extract

Hundred grams of coarsely powder of leaves was defatted with petroleum ether using soxhlet apparatus. The defatted marc was further extract with ethanol using soxhlet and the extract obtained was concentrated using rotary evaporator. Then, the percentage yield of extracts was 15g and stored in a desiccator.

Phytochemical screening

Phytochemical investigation of ethanolic extract of *Ipomea mauritiana* leaves.Table 1: Phytochemical constituents of ethanolic extract of *I.mauritiana*

Name of the chemical constituent	Ethanolic extract of *I.mauritiana*
Alkaloid	Present
Sterols	Present
Gums	Absent
Flavonoid	Present
Saponins	Absent
Glycoside	Present
Tannins	Present
Carbohydrates	Present
Phenols	Present

Drug protocol

Diazepam (0.5mg/kg, *i.p.*) was used as standard drug obtained in the form of ampule. It was diluted with normal saline to required strength before use.

Experimental animal

Swiss albino mice (males; 20-25 g) were produced from disease free small animal house, Swami Vivekanand College of pharmacy, Indore
M.P. (India). Since, estrogen are the female sex hormones, found to have neuroprotective effect,

therefore, we have excluded female mice and usedonly male mice for the present of study. The mice were kept at constant temperature (22±2ºC) and12-h light and 12-h dark. Mice were fed standard laboratory food and water was given *ad libitum.* The animal were acclimatized to the laboratory condition before experimental. Experiments werecarried out between 09:00 AM- 04:00 PM. The experiment protocol was approved by Institutional Animals Ethics Committee (IAEC), Care of theanimals was taken as per guidelines of the Committee for the Purpose of Control and Supervision of Experiments on Ani mal(CPCSEA), Government of India, New Delhi. (Registration No. 1839/OP/ERe/S/15/CPCSEA). **Acute toxicity study**

Acute toxicity study procedure was followed as per OECD 423 guidelines. The *Ipomea mauritiana* ethanolic extract was administered orally at the dose of 500mg/kg, 1500mg/kg, 2000mg/kg and 2500mg/kg. Control group of administered saline (10ml/kg of animal). The literature search of conventional LD_{50}test shownnot any sing of toxicity or mortality was observedat the higher dose of 2000mg/kg during the The plus maze device included two open arms (16 x 5 cm) and two closed arms (16 x 5 x 12 cm), as well as an open ceiling that was raised (25 cm) from the ground. Individual 20-25g Swiss albino mice were given a 30 minute bath in normal saline, diazepam extract, and then put in the middle of an elevated plus maze with their backs to a closed arm. Five minutes were recorded of time spent in the bath with arms open and closed. Seconds were the units of time used. During the experiment, we tallied how many participants entered the test via the open and closed arms.

All four paws must be touching the arm to count as an entry.

A Dual-Color Scheme ModelThe light and dark box was a simple wooden box with a removable lid. One compartment is painted black and made gloomy by covering its top with black plywood; its dimensions are 25 cm x 35 cm by 35 cm. The other room is painted white and made light by covering its dimensions with white plywood.the open box was positioned 25 centimeters from a strong white light source (40 watts). A floor-level opening (7.5 cm in length, 7.5 cm in width) in the middle of the divider led from one chamber to the other. After 30 minutes of oral therapy, the mice were put singly in the middle of the light box and monitored for 5 minutes.Mathematical dissectionThe data was summarized as a Mean SEM. One-Way Analysis of Variance (ANOVA) and Tukey's post-hoc test were used to establish statistical significance, with p0.05 being deemed significant.Discussion and Results

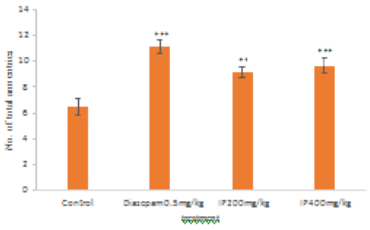
Analysis of Acute Oral Toxicity

The extract was given orally at doses of (500mg/kg, 1500mg/kg, 2000mg/kg, and 2500mg/kg) for the acute oral toxicity study. At 14 days, animals were evaluated for overall behavior and physical development. At the doses tested, there were no harmful effects from the extract, and animals continued to behave normally. For its anxiolytic properties, the doses of 1/10th and 2/10th of the standard anxiolytic (2000mg/kg) were used.

Model of an Inclined Maze

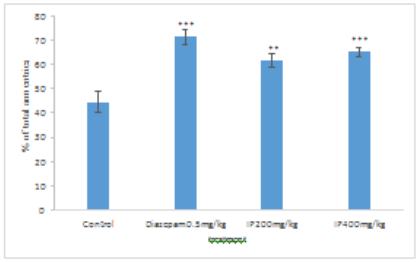
The frequency of open-arm entrances, duration spent in the open arms, and open-arm rears all increased significantly after diazepam administration. They spent less time holding one other closely. The number of open arm entries, the amount of time spent in the open arm, the overall number of arm entries, and the number of rear sinthe open arms were all significantly higher in plant extract-treated mice, whereas the amount of time spent in the closed arms was much lower. (Table3) Table 3: effect of administration of *Ipomea Mauritiana* ethanolic extract on mice behavior in elevated plus maze

Treatment	Number of open arm entries	Number of total arm entries	Percentage of open arm entries	Time spent in open arm (s)	Time spent in closed arm(s)	Percentage of total time spent in open arm	Number of rears in open arm
Control	2±0.25	6.5±0.61	44.44±4.36	24.66±2.77	275.33±2.77	8.22±0.92	1.16±0.16
Diazepam (0.5 mg/kg)	4.66±0.33***	11.16±0.54***	71.42±3.01***	103.33±4.99***	196.16±4.99***	34.60±1.66***	3.83±0.30***
IP (200 mg/kg)	3.5±0.22**	9.16±0.40*	61.66±2.68**	84.16±15.62**	215.83±15.62**	28.05±5.20**	2.5±0.34*
IP (400mg/kg)	3.83±0.30***	9.66±0.61**	65.23±1.81***	101±8.64***	199±8.64***	33.66±2.88***	3.5±0.42***



Graph 2: Number of total arm entries in EPM

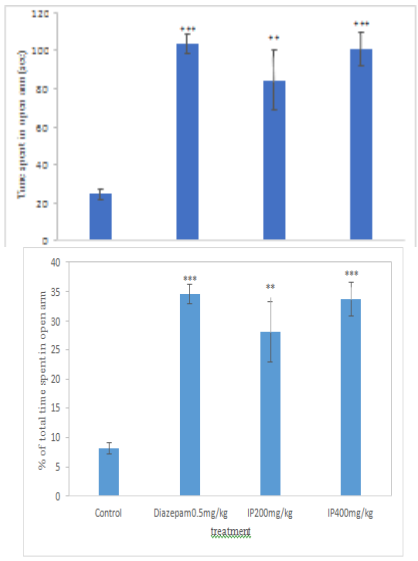
Values are expressed as Mean ± SEM. Data was analyzed by one-way ANOVA followed by tukey's *post-hoc* test, *p<0.05, ***p<0.001, compare with control group



Graph 3: Percentage of open arm entries in EPM

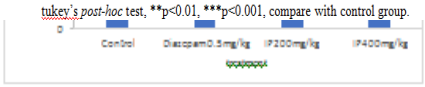
Values are expressed as Mean ± SEM. Data was analyzed by one-way ANOVA followed by tukey's *post-hoc* test, **p<0.01, ***p<0.001, compare with control group.

by



Graph 6: Percentage of total time spent in open arm in EPM

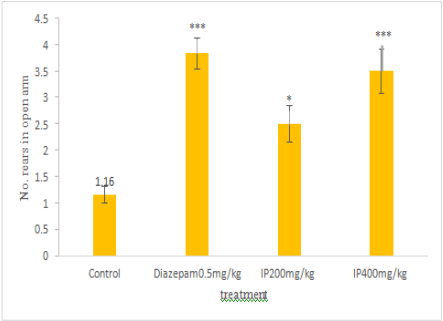
Values are expressed as Mean ± SEM. Data was analyzed by one-way ANOVA followed by tukey's *post-hoc* test, **p<0.01, ***p<0.001, compare with control group.



Graph 5: Time spent in closed arm in EPM

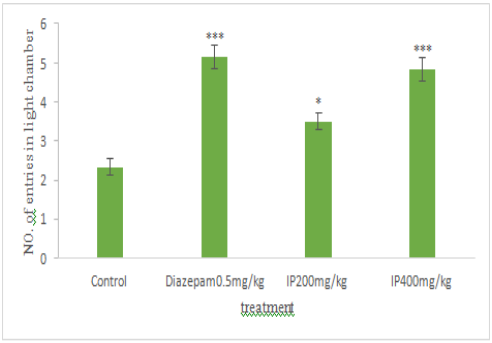
Values are expressed as Mean ± SEM. Data was analyzed by one-way ANOVA followed by tukey's *post-hoc* test, **p<0.01, ***p<0.001, compare with control group.

also showed a reduction in duration of immobilityat all two doses. (Table 4)



Graph 7: Number of rears in open arm in EPM

Values are expressed as Mean ± SEM. Data was analyzed by one-way ANOVA followed by tukey's *post-hoc* test, *p<0.05, ***p<0.001, compare with control group.



Graph 8: Number of entries in light chamber

Light and dark model

The standard drug diazepam treated mice have spent increased time in light area and also rear significant. Plant extract treated mice showed an increase in the time spent in light area and they

Table 4: Effect of administration of *Ipomea Mauritiana* ethanolic extract on mice behavior in light and dark model

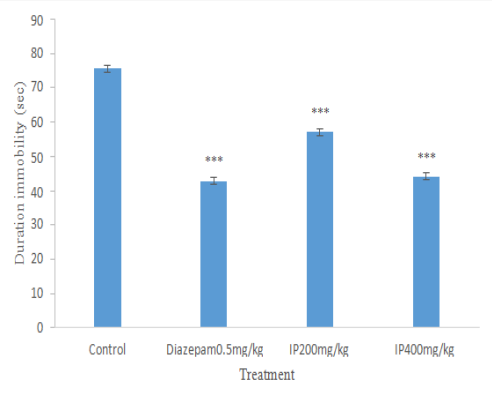
Treatment	Number of light chamber entries (s)	Time spent in light chamber (s)	Number of rears in light chamber (s)	Duration of immobility(s)
Control	2.33±0.21	81.5±4.18	2.5±0.22	75.5±3.17
Diazepam (0.5mg/kg)	5.16±0.30***	123±7.24***	4.83±0.30***	42.83±1.13***
IP (200mg/kg)	3.53±0.22*	113±2.84***	3.5±0.22*	57±2.46***
IP (400mg/kg)	4.83±0.30***	122±1.39***	4.66±0.21***	44.16±1.07***

GABAergic and serotonergic systems are involved in anxiety disorders. Anxiety was shown to involve both the adrenergic and dopaminergic systems. Anxiety has been treated with BZA for 40 years, but the drug's unfavorable side effects have prompted the search for more favorable therapy options. New treatments for various conditions may be discovered in medicinal plants. There are no reports of scientific examination of the anxiolytic efficacy of Ipomea Mauritiana, despite its widespread traditional usage for treating numerous diseases. Using an elevated plus maze, light-dark paradigm, the current study shows that the Ipomea Mauritiana extract reduced anxiety in mice.

The raised plus maze is a reliable animal model of anxiety based on etiological considerations. The open arms in the raised plus maze are scarier than the closed ones. A high degree of dread and anxiety is shown in the decreased rate of entrance and length of time spent in open arms. Then The use of anxiolytics has been shown to enhance both the frequency with which participants enter the open arms and the length of time they spend there. After receiving one of the two dosages of Ipomea Mauritiana, a statistically significant increase in open-arm contact time was found. After receiving 400mg/kg of Ipomea Mauritiana extract, both times pent in open arms significantly increased, indicating anxiolytic action.

Mice have a built-in dislike to bright light, therefore this is the basis for the light/dark exploration test. Anxiety is indicated by a decrease in the frequency of light chamber visits, the amount of time spent there, and the presence of rearing activity. Anti-anxiety medications improve light tolerance and decrease the dark

compartment's use. Both 200mg/kg and 400mg/kg of Ipomea Mauritiana extract showed anxiolytic-like action in this animal by significantly increasing time spent in the illuminated box and decreasing immobility.



Graph 11: Duration of immobility in light darkmodel

Similar to the effects of the common medication diazepam, the animal's behavior changed across the board, suggesting reduced anxiety, decreased aversion to light, and greater exploratory activity.

Conclusion

The elevated plus maze (EPM) and the light-dark maze (LDM) were used to measure anti-anxiety performance. Diazepam was used as the gold standard medication. Leaf extracts may include the active ingredients responsible for their anti-anxiety action, since all of them have showed considerable activity when compared to the controls. However, further research is needed to determine the precise mechanism of action and identify the active chemical (or compounds) responsible for this pharmacological activity..

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