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Research Article

EFFECT OF PETROLEUM ETHER EXTRACT OF MALKANGNI (*CELESTROUS PENICULATUS* WILD) ON OPEN FIELD BEHAVIOR IN SWISS ALBINO MICE

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ABSTRACT

The effects of an acute and repeated administration of petroleum ether extract from the seeds of Malkangani (*Celestrus Paniculatus* Wild) on explorarity activity and emotional reactivity was examined on open field behaviour in Swiss albino mice. A single acute administration of the extract did not induce any significant behavioral effect. However repeated administration of the test drug significantly increased grooming, rearing and decreased defecation in dose related manner.

Keywords: *Celastrus paniculatus* wild, grooming, rearing, Imipramine, open field behavior.

INTRODUCTION

Celastrus paniculatus is one of the CNS active dugs mentioned in the classical literature. The oil extract from the seeds of this plant is known to have effects on CNS[1] and have been reported to have beneficial effects in psychiatric patients[2]. It has been found to possess sedative and tranquilizing activity[3-5]. In a screening test, the drug was found to reduce immobility time in forced swimming despair[6], a characteristic feature of antidepressants. However, no investigation into the behavioural effects of this drug has been reported and present study is an endeavour to study the effect of this drug on open field behaviour in mice. Open field behaviour test provides a screening method for the study of the effect of drugs on exploratory motor activity and on emotional defecation in animals, in an unfamiliar (open field) situation[7]. Ambulation and rearing in an unfamiliar environment may be regarded as expressions of exploratory behaviour or coordinated motor reactions to environmental stress and defecation in the measure of emotional reactivity[8].

MATERIAL AND METHODS

Animals

Male swiss albino mice (22 to 28 g) used in the experiments were procured from central animal house facility, Jamia Hamdard, New Delhi, India and housed in polypropylene cages at a temperature of 25 ± 1°C with a 12 h / 12 h light dark cycle and free access to food and water. The experiments were conducted between 09.00 h and 17.00 h after overnight fasting with ad libitum access to water and in accordance with the guidelines for care and use of laboratory animals let down by the committee for the purpose of control and safety of experiments on animals (CPCSEA) ministry of social justice and empowerment, Govt. of India 2000.

Celastrus paniculatus Wild Extract Preparation

The seeds of *Celastrus paniculatus* wild were purchased from local market old Delhi, India and authenticated in the department of pharmacognosy, faculty of pharmacy, Jamia Hamdard. A voucher specimen (CPP - 2002) has been retained and deposited in the museum, department of pharmacology, faculty of medicine, Jamia Hamdard. The seeds were crushed and extract was achieved using petroleum ether in Soxhlet apparatus for 24 h and the solvent was recovered under reduced pressure. The yield was approximately 30 % (w / w of the dried starting material). The extract was suspended in water using CMC (0.25 %) for experiments.

Drugs

Imipramine (Ranbaxy) 20 mg / kg and Buspirone (zoldec pharmaceuticals, India) 2.5 mg / kg was suspended in water using CMC and administered orally in the volume of 1 ml / 100 g weight of animal. The water emulsion of the test drug 200 mg / kg and 400 mg / kg was also given orally in the dose vol. of 1 ml / 100 g weight of animal.

Statistical Analysis

The data obtained here were evaluated by one way analysis of variance (ANOVA) followed by dunnets "t" test and expressed as mean ± S.E.M. The results were considered significant when $p < 0.05$.

Experiments

The open field test was carried out in accordance with the method of [9,10] and modified in the light of[11]. The apparatus consisted of an open field arena having a diameter of 84 cm and height of 25 cm, the floor divided into 18 quadrants by dark lines with a central circle. Animals were divided into 4 groups of 6 animals each. Group I served as control and received distilled water. Group II received Impramine 20 mg / kg P.O. while Group III and IV were administered with test drug extract (CP) 200 and 400 mg / kg respectively for 15 days. Group V received Buspirone 2.5 mg / kg for the same period. On the day of experiment 2 h after the treatment, the animals were tested individually for 3 minutes on the arena and the behaviour was observed by counting ambulation, rearing and defecation response using a hand operated counter.

RESULTS

Effect of the Test Drug Extract on Ambulatory Response of Mice in Open Field Test

Single dose administration of the test drug did not produce any significant change in the response. While as Buspirone

increased it significantly. Impramine decreased it significantly. A dose related statistically significant increase in the ambulation response was observed on repeated administration of the drug as well as with Buspirone. Impramine conversely decreased it. (Table 1)

Effect of the Test Drug Extract on Rearing Response of Mice in the Open Field Test

Acute dosage of the test drug did not produce any significant effect. Repeated administration increased the rearing response significantly in a dose dependent mannar comparable to Impramine and Buspirone. (Table 2)

Effect of the Test Drug Extract on Defecation Response of Mice in Open Field Test

No significant effect was evident on acute dosage. However, a highly significant reduction was observed in the number of fecal boli on repeated administration. (Table 3)

Table 1: Effect of CP 200 and 400 mg/l on Ambulatory Response of Mice in the Open Field Test

Drug	Acute Study	Repeated (15 days)
Mean Score ± S.E.	**Mean Score ± S.E.**	**Mean Score ± S.E.**
Control	60.4 ± 5.0	53.3 ± 7.2
CP 200 mg / kg	58.8 ± 4.9	61.7 ± 6.2*
CP 400 mg / kg	57.9 ± 5.4	71.4 ± 6.4*
Impramine 20 / mg / kg	42.7 ± 3.1*	47.6 ± 6.6*
Buspirone 2.5 mg / mg	71.4 ± 4.6*	76.7 ± 6.7*

n = 6 *p < 0.05

Table 2: Effect of CP 200 and 400 mg on Rearing Response of Mice in Open Field Test

Drug	Acute Study	Repeated Study (15 days)
Mean Score ± S.E.	**Mean Score ± S.E.**	**Mean Score ± S.E.**
Control	17.3 ± 1.3	13.0 ± 1.3
CP 200 mg / kg	20.9 ± 1.1	26.7 ± 1.7*
CP 400 mg / kg	21.6 ± 1.4	28.8 ± 1.9*
Impramine 20 / mg / kg	21.7 ± 1.6*	32.6 ± 3.6*
Buspirone 2.5 mg / mg	27.3 ± 1.8*	30.7 ± 3.7*

n = 6 *p < 0.05

Table 3: Effect of CP 200 and 400 mg on Defecation Response of Mice in Open Field Test

Drug	Acute Study	Repeated Study (15 days)
Mean Score ± S.E.	**Mean Score ± S.E.**	**Mean Score ± S.E.**
Control	15.6 ± 1.8	16.2 ± 1.7
CP 200 mg / kg	14.6 ± 1.9	9.4 ± 1.6*
CP 400 mg / kg	13.6 ± 2.6	8.1 ± 1.2*
Impramine 20 / mg / kg	10.2 ± 1.9*	7.4 ± 0.8*
Buspirone 2.5 mg / mg	9.1 ± 1.6*	7.5 ± 0.7*

n = 6 *p < 0.05

DISCUSSION

The use of animal models of human mental disorders despite their obvious limitations, have proved to be valuable in the pre clinical behavioral analysis of various psychotropic agents or for experimental validification of such pcycho pharmalogical agents already in clinical use. Though there is little question that animal models of psychiatric disorders suffer from lack of understanding of the basic disease process being modeled, they should be of predictive validity wherein the models should be able to correctly identify a particular class of psychotropic agents, without making errors of omission or commissions. Animals removed from their acclimatized home cage and placed in a novel environment express their anxiety fear and stress by showing decrease in ambulation and exploration, immobilization or freezing, reduction in normal rearing and grooming behaviour and increased defecation due to augmented autonomic activity. Such effects are subject to reversal by anxiolytics and certain antidepressants and augmented by anxiogenic agents. *Celustrus paniculatus* wild has been shown to have tranqilizing properties[12] is effective in various nuero-psychiatric disorder[13]. Single acute administration of the drug failed to induce any significant behavioural effect in contrast to Buspirone, which increased ambulation significantly. Imipramine contrarily decreased it. However repeated administration of the test drug extract significantly increased locomotion (ambulation and raring) and decreased defecation comparable to that of the non-benzodiazepine and anti anxiety agent, buspirone. Repeated administration of Imipramine increased rearing (complex stereotyped behaviour) at the cost of ambulation (simple stereotyped behavior), which was in accord with the earlier findings of[14]. The diminution in the locomotion observed after acute administration of imipramine can be due to its sedative effect. The present study, thus, corroborates some of the clinical reports indicating that Malkangni (*Celasprus paniculatus*) may b effective in therapy of anxiety and depression particularly as adjunct with main therapeutic majors. Since a vast array of neurotransmitters is involved in anxiety and depression, it would be premature to hazard a cogent explanation in terms of its neurochemical effects. A systemic investigation of its effects on major neuro transmitter systems needs to be undertaken to provide a rational explanation for the observed effects.

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