ejpmr, 2018,5(4), 136-142

SJIF Impact Factor 4.897

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

ANALGESIC, ANTI-INFLAMMATORY AND CNS DEPRESSANT ACTIVITIES OF THE METHANOL, ETHYL ACETATE AND CHLOROFORM FRACTIONS OF *STEREOSPERMUM PERSONATUM* (HASSK.) CHATTERJEE FRUITS IN MICE

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Article Received on 09/01/2018 **Article Revised on 01/03/2018** **Article Accepted on 21/03/2018**

ABSTRACT

The study was designed to evaluate the analgesic, CNS depressant and anti-inflammatory activities of methanol, ethyl acetate and chloroform fraction of *Stereospermum personatum* (*S.Personatum*) fruits on Swiss Albino mice. Analgesic activity was performed by acetic acid-induced writhing model and formalin induced licking and biting in mice. Anti-inflammatory effects were done by carrageenan induced hind paw edema. The CNS depressant activity was evaluated by observing the hole cross and opens field tests. The methanol, ethyl acetate & chloroform fractions were investigated by 200mg/kg and 400mg/kg dose. Statistical analysis showed that dose of (200 and 400mg/kg) exhibited (significant* $p<0.05$) moderate analgesic activity (43.16% and 59.35%), (46.76% and 65.46%) and (51.43% and 77.33%) for methanol, ethyl acetate and chloroform fractions respectively against acetic acid induced pain in mice compared to standard (87.05%) and formalin induced exhibited (significant* $p<0.05$) highly analgesic activity (66.66% and 86.95%), (72.46% and 79.85%) and (84.05% and 94.20%) respectively. Furthermore, Late phase methanol, ethyl acetate and chloroform (200mg/kg and 400mg/kg) higher than standard drug diclofenac sodium (56.52%). Methanol ethyl acetate and chloroform (200mg/kg and 400mg/kg) showed significant anti-inflammatory activity at 1_{st} h to 4_{th} hours. On the other hand, Fractions (200mg/kg and 400mg/kg) showed significant (*$p<0.05$) depressant activity at 30min to 120min in the hole cross and open field test. This study focused that the effect of methanol, ethyl acetate and chloroform fractions of *S. personatum* fruits (400mg/kg) dose has shown significant analgesic, CNS depressant action and moderate anti-inflammatory activity.

KEYWORDS: *Stereospermum personatum;* Analgesic; anti-inflammatory; CNS Depressant; Methanol; Ethyl acetate; Chloroform.

INTRODUCTION

Plants are an essential component of the universe. Human beings have used plants as medicine from the very beginning of time. After various observations and experiments medicinal plants were identified as a source of important medicine. Therefore, treatment of medicinal plants began in the early stages of human civilization.[1] A medicinal plant is any plant which, in one or more of its organ, contains substance that can be used for therapeutic purpose or which is a precursor for synthesis of useful drugs.[2] *S. personatum* is recognized as medicinal tree and it is belongs to the Bignoniaceae family. It has different type of local name (English: Trumpet Flower; Hindi: Patiri; Tamil: Poopadiri, Paadhalaamaram; Malayalam: Karingkruna; Flora of Nilgiri Biosphere). Flower: In axillary corymbs, yellow veined red. Flowering peaks during April-June (lower slopes) and July-September (higher slopes). Tropical Thailand, Indo-China, Malaysia, Himalaya, Sri Lanka, Burma, commonly available found in India. In Bangladesh, it is also found in the forests of Chittagong, Chittagong Hill Tracts, Cox's Bazar, Gazipur Sylhet and Tangail.[3]; It is a medium sized medicinal tree.[4] Bark used in medicinal preparations. Wood is used to make furniture. Field Tips: Fruits are spirally twisted. Flowers bell shaped. Bark brown, wood hard, greyish brown with dark patches.[5] Frequently used in ayurvedic system of medicine. It is one of the ingredients used in the preparation of an ayurvedic tonic. The fruits of *S. personatum* are used to cure migraine and bark is useful in the management of piles. It has antimicrobial, antiprotozoal and anti-inflammatory properties.[6] Stereospermum other species found medicinal effect and their leaves, roots, bark, flowers and fruits all have potential medical applications. Its generaly used as anti-inflammatory, anti-bacterial, febrifuge diuretic, Lithotropic, anti-pyretic, rheumatalgia expectorant, cardio tonic, wound, asthma malarial fever, and cough.

Flavonoid, Quinones, Cardioglycosides, Terpenoids, Steroids and Alkaloids such like bioactive compounds are present in high concentration in Stereospermum species.[7] Bioassay-guided fractionation of different extracts of both stem and stem bark of *S. personatum* led to the isolation of free-radical-scavenging and xanthine oxidase inhibitory.[8] The study was carried out to assess the analgesic, anti-inflammatory and CNS depressant activity of the methanol, ethyl acetate and chloroform extract of the *S. personatum* fruits. This is high therapeutic value. Since there is no specific results about the analgesic, anti-inflammatory and CNS depressant properties of the various types fraction of *S. personatum* fruits respectively. Also we have used very simple and eco-friendly process to evaluate result and low cost.

MATERIAL AND METHOD

Plant material

The plant *S.personatum* fruits was collected from the area of National Botanical garden, Dhaka, Bangladesh and were identified by a taxonomist of Bangladesh National Herbarium, Dhaka. The leaves of that plant was dried for a week under sunlight and pulverized into a coarse powder using a suitable grinder. The powder was stored in an airtight container and kept in a cool, dark and dry place until use for analysis.

Preparation of extract

About 200 gm of powdered material was taken in a clean round bottomed glass container and soaked in 200 ml of 85% methanol another flat bottomed glass container and soaked in 200 ml of 85% ethyl acetate and same process chloroform. The container with its contents was sealed and kept for a period of one week accompanying occasional shaking and stirring. The whole mixture then underwent a coarse filtration by a piece of clean, white cotton material. Then it was filtered through Whatman filter paper (Bibby RE200, Sterilin Ltd., UK). The filtrate (methanol, ethyl acetae and chloroform extract) obtained was evaporated using a rotary evaporator. It rendered a gummy concentrate of reddish black color. The gummy concentrate was designated as a crude extract of methanol, ethyl acetate and chloroform. The extract was transferred to a closed container for further use and protection.

Animal

Swiss albino mice of either sex weighing about 25-35 gm were used for the experiment. The mice were purchased from the animal Research Branch of the International Centre for Diarrheal Disease and Research, Bangladesh (ICDDR, B) were used for the evaluation of analgesic activity, anti-inflammatory and CNS depressant. The animals were housed under standard laboratory conditions (relative humidity 55–65%, room temperature 23.0±2ºC and 12-h light, 12-h dark cycle). The animals were fed with a standard diet and water ad libitum in all animal experiments; the guidelines of the Animal Experimentation Ethics Committee, ICDDR, B were followed. Each group consists of five mice and the animals are divided into four groups. Experiments on animals were performed in accordance with guidelines of the Institutional Animal Ethics Committee.[9]

Chemicals

Diclofenac sodium and Diazepam were obtained from Beximco Pharmaceuticals Company Ltd., Bangladesh; Acetic acid was purchased from Merck, Germany. Normal saline water (0.9% NaCl), a product of Beximco Infusion Company Ltd., Bangladesh was purchased from local market. BDH Chemicals Ltd kindly provided tween-80, formalin, Carrageenan and all other chemicals were of analytical grade.

Analgesic Activity

Acetic acid-induced writhing method

To find out the analgesic activity of the samples was studied using acetic acid-induced writhing model in mice.[10] Test samples (200 and 400 mg/kg body weight), vehicle (1% tween 80 in water) and Diclofenac sodium (10mg/kg) were administered orally 30 min before intraperitoneal administration of 0.1% acetic acid. Then the mice were observed for specific contraction of the body referred to as 'writhing' for the next 30 min.[10] Full writhing was not always accomplished by the animal, because sometimes the animals started to give writhing but they did not complete it. This incomplete writhing was considered as half writhing. Accordingly, two half-writhing were taken as one full writhing. The number of writhes in each treated group was compared to that of a control group while Diclofenac sodium (10mg/kg) was used as a reference substance (positive control). The percent inhibition (% analgesic activity) was calculated by % inhibition = {(A-B) /A} X100.Where, A= Average number of writhing of the control group; B= Average number of writhing of the test group.

Formalin test

The antinociceptive activity of the drugs was determined using the formalin test.[10] The control group received 2.5% formalin. 20 µl of 2.5% formalin was injected into the dorsal surface of the right hind paw 30 min after administration of methanol, ethyl acetate and chloroform extract of *S. personatum* fruits (200 and 400 mg/kg, p.o.) and Diclofenac sodium (10 mg/kg, p.o.). The mice were observed for 30 min after the injection of formalin, and the time spent licking of the injected hind paw was recorded. The first 5 min post formalin injection was referred to as the early phase and the period between 15 and 30 min as late phase. The total time spent of licking and biting of the injured paw (pain behavior) was measured with a stop watch.

Anti-Inflammatory Activity

Carrageenan-induced paw edema method

The mice were divided into five groups, each containing 5 mice. Acute inflammation was induced by injecting 0.1 ml of (1%) carrageenan into the plantar surface of the mouse's hind paw.[11] The extract (200 and 400 mg/kg), normal saline (1 ml/kg) and diclofenac (10 mg/kg, i.p.)

as the referral agents were administered 30 min before carrageenan injection. The paw volume was measured at 0, 1, 2, 3 and 4 h using a vernier caliper to determine the diameter of edema. The difference between the readings at time 1 h and different time interval was taken as the thickness of edema.

CNS Depressant Activity

Hole cross test

The method was carried out as described by.[12] A steel partition was fixed in the middle of A steel partition was fixed at the middle of a cage having a size of 30×20×14 cm. A hole of 3 cm diameter was made at a height of 7.5 cm in the center of the cage. Twenty mice were divided into four groups with five mice in each group. Mice of group-I received vehicle (1% Tween-80) at 10 ml/kg body weight (p.o.), group-II received diazepam at 1 mg/kg body weight (p.o.) while group-III, IV, V, VI, VII and group VIII were treated with 200 and 400 mg/kg body weight (p.o.) of the extract. The number of mice passed through the hole from one chamber to another was counted for a period of 3 min on 0, 30, 60, 90 and 120 min after oral administration of test samples.

Open field test

The animals were treated as discussed above. The experiment was carried out according to the methods described by.[13] The floor of an open field of half square meter was divided into a series of squares each alternatively colored black and white. The apparatus had 40cm height a wall. The number of squares visited by the animals was counted for 3 min for 0, 30, 60, 90 and 120 min after oral administration of test drugs.

RESULT

Analgesic Activity

Acetic acid induced writhing in mice

The effect of methanol, ethyl acetate and chloroform extract of *S. personatum* fruits was investigated against acetic acid induced writhing in mice (Table-1). In group-I, mice taking only vehicle were found to show elevated writhing which was a consequence of acetic acid (1%) induced contraction of the body. About 87.05% inhibition of writhing was found in group-II while mice were treating with a reference drug, Diclofenac sodium (10 mg/kg). The methanol, ethyl acetate and chloroform extract of *S. personatum* fruits (200mg/kg and 400mg/kg) significantly reduced the acetic acid induced abdominal constrictions and stretching with a dose dependent manner (group-III, IV, V, VI, VII and group VIII) compared to control . The reduction was significant *p<0.05 when compared with control.

Table-1: Effects of the methanol, ethyl acetate and chloroform extract the fruits of *S. personatum* on acetic acid induced writhing in mice.

Groups	Dose mg/kg	No. of writhing	% inhibition
Group I (control)	Vehicle	55.6±3.49	-
Group II (standard)	10	7.2±0.19*	87.05
Group III	200	31.6±3.12*	43.16
Group IV	400	22.6±3.06*	59.35
Group V	200	29.6±1.72*	46.76
Group VI	400	19.02±2.94*	65.46
Group VII	200	27±2.44*	51.43
Group VIII	400	12.6±1.44*	77.33

Values are mean ± SEM=standard error of mean (n = 5); *p<0.05 Dunnt test as compared to vehicle control (one way ANOVA followed by Dunnet's test) Group I animals received vehicle (1% Tween 80 in water), Group II received Diclofenac Na 10 mg/kg body weight, Group – III and group IV group V and group VI group VII and group VIII were treated with (200 and 400 mg/kg) (p/o) methanol, ethyl acetate and chloroform extract of *S. personatum* fruits respectively.

Formalin induced hind paw licking in mice

The experiment was carried out to test whether extract of *S. personatum* fruits had any effect on formalin induced hind paw licking in mice. The chloroform extracts 400mg/kg given higher percent 94.20% protection of hind paw licking in mice group VIII (Table-2). The extract (200 and 400mg/kg) body weight pretreated mice showed a good significant (*p<0.05) dose-response reduction of the hind paw licking caused by formalin when compared to that of control and the extract at both tested doses showed better activity than reference standard Diclofenac sodium at 10 mg/kg dose.

Table-2: Effects of the methanol ethyl acetate and chloroform extract the fruits of *S. personatum* on hind paw licking in the formalin test in mice.

Groups	Dose(mg/kg)	Early phase	% of protection	Late phase	% of protection
Group I (control)	vehicle	26.2± 1.38	-	13.80±1.14	
Group II (standard)	10	12.2±1.14*	53.01	6.00±1.25 *	56.52
Group III	200	17.4± 1.87*	33.45	4.60±1.06*	66.66
Group IV	400	11 ± 2.26*	58.55	1.80 ± 0.91*	86.95
Group V	200	16±1.25*	38.67	3.80± 0.91*	72.46
Group VI	400	6.8±2.13*	74.34	1.40±0.74*	79.85
Group VII	200	11.8±1.60*	54.42	2.20±0.91*	84.05
Group VIII	400	9.4±1.58*	64.17	0.80±0.91*	94.20

Values are mean ± SEM=standard error of mean (n = 5), *p<0.05 as compared with vehicle control (one way ANOVA followed by Dunnet's test. Group I animals received vehicle (1% Tween 80 in water), Group II received Diclofenac Na 10 mg/kg body weight, Group-III and group IV group V and group VI group VII and Group VIII were treated with 200 and 400 mg/kg (p.o) methanol, ethyl acetate extract and chloroform of *S. personatum* fruits respectively.

Anti-Inflammatory Activity

Carrageenan induced paw edema in mice

The result of the effect of *S. personatum* on carrageenan-induced edema is shown in (Table-3). The *S. personatum* exerted a significant (*p<0.05) anti-inflammatory effect at the dose of (200 and 400 mg/kg) at 0 to 4th hours which was comparable to that of the control group. The percentage inhibition activity of *S. personatum* (200 and 400 mg/kg) and standard (diclofenac sodium) 10 mg/kg were found to be 71.00%, (32.54% and 39.64%) methanol (33.13% and 38.46%) ethyl acetate and (39.48% and 45.64%) chloroform respectively.

Table-3: Effect of *S. personatum* methanol, ethyl acetate and chloroform extract of fruits on carrageenan induced paw edema in mice.

Groups		Oedema diameter(mm)					Inhibition (%)				
Group	Dose(mg/kg)	0min	1hr	2hr	3hr	4hr	0min	1hr	2hr	3hr	4hr
Group I	Vehicle	4.32±0.36	3.90±.0.35	3.62±0.28	3.38±0.28	3.18±0.28		-	-		
Group II	10	2.42±0.47*	1.86±0.46*	1.44±0.39*	1±0.31*	0.98±0.29*	43.98	52.31	60.22	70.41	71.00
GroupIII	200	3.70±0.26*	3.20±0.27*	2.82±0.28*	2.48±0.28*	2.28±0.28*	14.35	17.95	22.09	26.62	32.54
GroupIV	400	3.30±0.28*	2.92±0.28*	2.56±0.23*	2.26±0.23*	2.04±0.23*	23.61	25.12	29.28	33.13	39.64
Group V	200	3.32±0.26*	2.92±0.29*	2.64±0.29*	2.34±0.23*	2.26±0.33*	23.14	25.12	27.07	30.76	33.13
Group VI	400	3.18±0.28*	2.74±0.23*	2.46±0.23*	2.22±0.38*	2.08±0.28*	26.38	29.74	32.04	34.31	38.46
Group VII	200	3.3±0.34*	2.8±0.32*	2.72±0.36*	2.54±0.23*	2.36±0.23*	23.61	82.20	30.25	34.87	39.48
GroupVIII	400	3.14±0.29*	2.68±0.28*	2.5±0.31*	2.36±0.29*	2.12±0.28*	27.31	31.28	35.89	39.48	45.64

Values (calculated as compared with control using one way ANOVA followed by Dunnet's test): * p<0.05. (n=5), ± indicates standard error mean. Group I animals received vehicle (1% Tween 80 in water), Group II received (Diclofenac sodium) 10 mg/kg body weight, Group- III and group IV group V and group VI group VII, and group-VIII were treated with (200 and 400 mg/kg) (p.o) methanol, ethyl extract and chloroform of *S. personatum* fruits respectively.

CNS depressant activity

Hole-cross test

Results of the hole-cross test of *S. personatum* are given in (Table-4). For methanol without 30, 90, 120 min (200mg/kg) and ethyl acetate 30 min (200 and 400 mg/kg) the Depressant activity of standard and extract were statistically significant (* p<0.05) of all dose levels at 0 to 120min and followed a dose-dependent response. The depressing effect of 200 and 400mg/kg was a better effect than standard.

Table-4: Effect of methanol, ethyl acetate and chloroform extract of the *S. personatum* fruits on hole cross test in mice.

Group	Dose(mg/kg)	Number of movements				
		0 min	30 min	60 min	90 min	120 min
Group I	Vehicle	11.80±1.33	10.00±1.25	8.40±1.06	6.20±0.95	5.20± 0.91
Group II	1 mg	6.60±1.068*	5.40±1.06*	3.80±.91*	3.80±1.47*	3.00±1.25*
Group III	200mg	8.80±0.915*	8.00±1.10	4.40±1.06*	4.80±1.14	3.80±1.14
Group IV	400mg	5.60±1.06*	4.60±1.06*	3.60±0.94*	2.60±0.74*	1.40±0.94*
Group V	200mg	8.40±1.44*	6.20±1.14*	5.00±1.10*	3.40±0.74*	2.40±0.74*
Group VI	400mg	5.00±1.25*	5.00±0.94*	2.40±0.74*	1.40±0.74*	0.40±0.74*
Group VII	200mg	7.80±0.91*	6.20±0.92	5.00±0.84*	3.60±0.94*	2.40±0.74*
Group VIII	400mg	5.60±0.74*	4.40±0.74	3.60±0.94*	2.60±0.74*	1.00±0.84*

Values are mean ± SEM=Standard error of mean. (n = 5); * p<0.05, Dunnet test as compared to vehicle control. Group I animals received vehicle (1% Tween 80 in water), Group II received diazepam 1 mg/kg body weight, Group III and group IV group V and group VI group VII and group VIII were treated with 200 and 400 mg/kg methanol, ethyl acetate and chloroform extracts (p.o) of *S. personatum* fruits respectively

Open-field test

The *S. personatum* extract exhibited a decrease in the movements of the test animals at all dose levels (Table-5). The results of Standard and extract (200 and 400 mg/kg) were statistically significant (*p<0.05) at 0 to 120min followed a dose-dependent manner.

Table-5: Effect of methanol, ethyl acetate and chloroform extract of the *S. personatum* fruits on open field test in mice.

Group	Dose(mg/kg)	Number of movements				
		0 min	30 min	60 min	90 min	120min
Group I	Vehicle	286.00±5.19	206.00±4.55	168.00+3.61	164.20±2.79	87±3.21
Group II	1	89±1.84 *	87.40±1.347*	70.±1.916*	65±1.778*	51+1.880*
Group III	200	198.60±5.58*	174.00±5.19	140.00±5.94	108.00±.61*	81.00±2.86
Group IV	400	168.00±6.29*	138.00±5.19*	130.40±5.47*	98.00±3.21*	60.20±3.44*
Group V	200	206.00±5.52*	154.00±2.03	127.80±6.29	115.40±5.82*	99.00±5.05
Group VI	400	176.00±5.36*	154.80±1.92	115.20±5.80*	102.80±5.07*	73.20±3.77
Group VII	200	189.00±4.09*	165.00±3.16*	152.00±6.64	107.80±2.92*	86.20±3.04
Group VIII	400	152.80±4.68*	146.20±2.60*	117.00±3.61*	90.80±2.95*	65.40±4.01*

Values are mean ± SEM=Standard error of mean. (n = 5). * p<0.05, Dunnet test as compared the control. Group I animals received vehicle (1% Tween 80 in water), Group II received diazepam 1 mg/kg body weight, Group III and Group IV group V and group VI group VII and group VIII were treated with 200 and 400 mg/kg methanol, ethyl acetate and chloroform fraction of *S. personatum* fruits respectively.

DISCUSSION

According to the pharmacological activity *S. personatum* is highly regarded as a universal panacea in the herbal medicine with diverse spectrum. Acetic acid induces pain by enhancing levels of PGE2 and PGF2α[14] at the receptors of peritoneal cavity[15,16], that mean the acetic acid acts indirectly by increasing the release of endogenous mediators, leading to stimulation of the nociceptive neurons which are sensitive to most of the non-steroidal anti-inflammatory drugs. *S. personatum* containing scopoletin is capable of ameliorating clinical symptoms of rat adjuvant-induced arthritis, by reducing numbers of new blood vessels in the synovium and the production of important endogenous angiogenic inducers.[17] The two different doses (200 and 400 mg/kg body weight) of methanol, ethyl acetate and chloroform extract of *S. personatum* fruits showed (significant *p<0.05 Table-1) moderate percent inhibition (43.16% and 59.35%), (46.76% and 65.46%) for methanol, ethyl acetate and chloroform fraction better analgesic activity (51.43% and 77.33%) respectively. By comparing with standard (reference drug Diclofenac Na 87.05%) methanol, ethyl acetate and chloroform extract (400mg/kg) given more analgesic action than (200mg/kg) also chloroform result best than methanol and ethyl acetate. Higher doses (400 mg/kg) were found to exhibit more analgesic activity against acetic acid induced pain in mice to the reference drug Diclofenac Na (87.05%). This result suggests the taking part of peripheral mechanisms of analgesia.

To evaluate the analgesic activity formalin test is another important model which is better related to the clinical pain.[18,19] This method elucidates central and peripheral activities. Formalin-induced nociception is biphasic in which first phase involves direct stimulation of sensory nerve fibers representing neuropathic pain and second phase involves inflammatory pain mediated by prostaglandin, serotonin, histamine, bradikinin and cytokines such as IL-1β, IL-6, TNF-α, eicosanoids and NO.[20,21,22,23,24,25] *S. personatum* fruits extract at the dose of (200 and 400 mg/kg) early phase and late phase all result show (significant *p<0.05 Table. 2) better percent of protection but dose (400mg/kg) show higher percent of protection than (200mg/kg) for methanol, ethyl acetate and chloroform respectively against licking and biting. Methanol, ethyl acetate and chloroform (200 and 400mg/kg) result more high than standard, Diclofenac Na (56.52%, Figure- 2) also chloroform result well than methanol, ethyl acetate. The suppression of neurogenic and inflammatory pains by the extract might imply that it contains active analgesic principles that may be acting both centrally and peripherally. This is an indication that the extract can be used to manage acute as well as chronic pain.

To Investigate the anti-inflammatory activity Carageenan induced paw edema has been commonly used as an experimental animal model for acute inflammation and is believed to be biphasic in which the early phase (0-2) of the carageenan model is mainly mediated by serotonin, and histamine developed the synthesis of prostaglandins in the injury tissue surroundings and the late phase is sustained by prostaglandin release and mediated by bradikinin, leukotrienenes, polymorpho nuclear cells,

and prostaglandins produced by tissue macrophage.[26,27] However, in this study the crude extract of *S. personatum* fruits at the dose of (200 and 400 mg/kg) all result exhibited (significant* $p<0.05$) moderate percent inhibition of paw edema 0 to 4th hours for methanol and ethyl acetate (Table-3). By comparing to standard (Diclofenac sodium) methanol, ethyl acetate and chloroform extract 400mg/kg result is higher than (200mg/kg) and also chloroform action few more than methanol and ethyl acetate. The possible mechanism of the observed anti-inflammatory activity might be its ability to reduce the release of histamine, serotonin or kinin like substances or biosynthesis of prostaglandins which is consistent with the test of analgesic activity.

Locomotor activity considered as develop in alertness and reduce in locomotor activity reported sedative effect.[28] Gamma-amino-butyric acid (GABA) is the main inhibitory neurotransmitter in the CNS. various anxiolytic, muscle relaxant, sedative-hypnotic drugs are illustrate their action through GABA, therefore it is possible that extracts of *S. personatum* behavior by potentiating GABA inhibition in the CNS via membrane hyperpolarization which leads to a decrease in the firing rate of critical neurons in the brain or may be owing to direct activation of GABA receptor by the extracts.[29] Many research focused that plant containing flavonoids, saponins and tannins is useful in many CNS disorders.[30] Hole cross test, methanol (200mg/kg) at 30,90,120 min and chloroform (200and 400mg/kg) at 30min were not show significant effect otherwise all doses showed significant (*P=0.05) depressant effect 0 min to 120 min for methanol, ethyl acetate and chloroform (Table 4) and depressant activity of extracts were nearer to reference drug. Open field test, methanol (200mg/kg) at 30,60 and 120 min, ethyl acetate (200and 400mg/kg) at 30,120 and 60min (200mg/kg) and chloroform (200mg/kg) at 60 min did not show significant activities otherwise all doses showed significant (*P=0.05) depressant effect 0 min to 120 min for methanol and ethyl acetate and chloroform (Table-5). By investigation on phytoconstituents and plants suggests that more flavonoids and neuroactive steroids were found to be ligands for the GABA receptors in the central nervous system (CNS); which led to assume that they can act as benzodiazepine molecules.[31]

CONCLUSION

This study focused that the effect of methanol, ethyl acetate and chloroform fractions of *S.personatum* fruits (400mg/kg) dose has shown significant analgesic, CNS depressant action and moderate anti-inflammatory activity. Since there is no specific results about the analgesic, anti-inflammatory and CNS depressant properties of the various types fraction of *S. personatum* fruits respectively. Also we have used very simple and eco-friendly process to evaluate result and low cost.

ACKNOWLEDGEMENTS

Authors thanks Luthfun Nesa, Mohammad Amjad Hossain, Muhammad Mohsin Hossain, Hossain Shima, Md. Abu Hanif for their kind co-operation in this research work, Department of Pharmacy, Atish Dipankar University of Science and Technology, Dhaka, Bangladesh for providing laboratory facilities to carry out the entire experiment

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