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Evaluation of CNS Depressant Activity of *Capparis zeylanica* Lin. root

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ABSTRACT

The dried ethanolic extract of the root of *Capparis zeylanica* Lin. (Capparidaceae) was assessed for effect on the Central Nervous System (CNS) using a number of neuropharmacological experimental models in mice. The extract (EECZ) on mice were tested in several animal paradigms, including sodium pentobarbital-induced sleep, open field tests and hole-cross tests. Mice acutely treated with ethanolic extract of *Capparis zeylanica* (EECZ) at 100, 200 and 400 mg kg^{-1} doses prolonged the sleeping time induced by pentobarbitone (40 mg kg^{-1}). This extract, at 100 and 200 mg kg^{-1} doses, showed a sedative effect in the hole-cross paradigm and decreased spontaneous activity in mice. The EECZ treatment did not produced mortality up to 2000 mg kg^{-1}. Chemical analysis showed that the EECZ alkaloids, steroids, phytosterol, fatty acids, phenols, flavonoids, flavonols, tannins and mucilage are the main compounds of the active extract. The extract produced a dose-dependent reduction of the onset and duration of pentobarbitone induced hypnosis, reduction of locomotor and exploratory activities in the open field, hole-cross tests etc. At the same dose levels, the ethanolic extract of *Capparis zeylanica* (EECZ) root dose-dependently inhibited acetic acid-induced writhing in mice. The mechanism of this depression is not clearly understood at this point but it can be assumed that the drug may exert CNS depressant effect by interfering with the function of cortex. The results have suggested that the crude hydroalcholic extract of *Capparis zeylanica* root possesses some biologically active constituents with sedative activities.

Key words: *Capparis zeylanica*, Capparidaceae, sedative effect, depressant, central nervous system, anxyolytic

INTRODUCTION

World is endowed with a rich heritage of medicinal plants. The use of medicinal agents presumably predates the earliest recorded history. The medicinal plants are widely used by the traditional practitioners for various ailments (Makhija *et al*., 2011). According to the World Health Organization (WHO), about three-quarters of the world population depends upon traditional remedies (mainly herbs) for the health care of its people. In fact, herbs/plants are the oldest friends of human being (Ansari *et al*., 2010). Advance in science and technology has contributed to an enormous improvement in the quality of life of humankind. However, modern life stress, associated trials and tribulation are responsible for the surge in incidence of variety of psychiatric disorders.

Path breaking research in psychopharmacology has flooded the market place with drugs for specification. For instance, benzodiazepines (diazepam, nitrazipam lorazepam and alprazolam etc.) are the most frequently prescribed synthetic drugs for variety of condition particularly anxiety, depression, epilepsy and insomnia. But these psychoneural drugs have very serious side effects like chronic use of benzodiazepines causes deterioration of cognitive function, physical dependence and tolerance. Besides addiction liabilities, benzodiazepines adversely affect the respiratory, digestive and immune system of body and the chronic treatment with benzodiazepines often prove more harmful in the longer run (Dhawanm and Dhawan, 2003). In this study, a resurgence of interest in medicine from natural sources (mainly plant products) is seen and there is tremendous hope that drugs of plant origin will have significantly lesser side effects than that observed with synthetic drugs while having comparable efficacy. However in order to avoid any harmful effect of herbal medicines time and duration of dose should be taken carefully (Karim *et al*., 2011). Many species of hallucinogenic (psychodysleptic) plants are used by humans throughout the world to achieve states of mind distortions; among those, a few have been used for therapeutic purposes, such as *Cannabis sativa* L., Tabernanthe iboga Baill and the mixture of *Psychotria viridis* and *Banisteriopsis caapi* (Carlini, 2003). In this continuation a well known plant, *Capparis zeylanica* Lin. which is traditionally used in ayurvedic medicine as rasayan. *Capparis zeylanica* Linn. (*C. horrida* Linn., *Capparis brevispina* DC.) is known as Indian caper belonging to family Capparidaceae. In Sanskrit it is known as Vyakhranakhi, kinkani, tapasapriya, granthila, karambha (Satyanarayana *et al*., 2008). It grows in moist habitat and is found throughout the majour parts of India. In different parts of India it is known with different names like Asadhua in Orissa, Kathotti in tamil etc. (Muthu *et al*., 2006). Almost all the parts i.e., Root, bark, fruits, leaves, fruits, seeds are used for different purposes. The root bark of *C. zeylanica* is used traditionally as stomachic, sedative, antihydrotic and also in cholera, neuralgia, hemiplegia and rheumatism. The roots of *C. zeylanica* were reported to have antibacterial, antioxidant activities; it also found to act as endothelin receptor antagonists (Duke, 2000). The roots of *C. zeylanica* contain alkaloid, phytosterol, fatty acids and mucilage etc. A new fatty acid E-Octadec-7-en-5-yonic acid has been isolated from the roots of chloroform extract of *C. zeylanica* (Haque *et al*., 2004). The *Capparis zeylanica* root in general and root bark in particular is also recommended traditionally for CNS problems and producing sedation (Chaudhary *et al*., 2004; Upaganlawar *et al*., 2008). It is also reported to posses anti-inflammatory and analgesic activity in its root in general and bark portion of root in particular (Chaudhary *et al*., 2004; Upaganlawar *et al*., 2008). The present investigation is for the evaluation of neuro-pharmacological potential of Capparis zeylanica root extract in mice.

MATERIALS AND METHODS

All the experiments were carried out in the year 2009-10 in the Department of Pharmaceutics, Institute of Technology, BHU, Varanasi as per the detail of standard references or with slight modification.

Plant and extract: Roots of *Capparis Zeylanica* Linn. (*C. horrida* Linn., *Capparis brevispinia* DC., were collected from Medicinal Plant garden of Banaras Hindu University campus and specimen (H. P. L. 512) has been deposited in the herbarium of the Laboratory of Department of Pharmaceutics, Institute of Technology, Banaras Hindu University, Varanasi, Uttar Pradesh, India. The roots were oven-dried at 40°C, pulverized in a room temperature and half of the powdered root was extracted with 95% ethanol in water and half in chloroform for 72 h. The extracts were dried at 60°C using rotavapor and the yield was approximately of 10.8 and 6.5% for obtaining the ethanol and chloroform extract of *Capparis zeylanica* Linn. roots.

Animals: Swiss mice of either sex (20-25 g) were obtained from the Central Animal House, Institute of Medical Sciences, Banaras Hindu University and were randomly distributed into different experimental groups (Each group consists of six animals). The animals were kept in six groups in a cage (Polypropylene) at an ambient temp. of 25±1°C and 45-55% relative humidity. The cycle of light/dark was maintained for 12:12 h. for each period. The animals were fed with standard diet and water ad libitum. Animals were acclimatized to laboratory conditions for at least one week before the start of experiment. The experiments were conducted between 9.00 and 14.00 h. The animals were subjected for experiment only once and principal for laboratory animal care (NIH publication number 85-23, revised 1985) guidelines were fully followed.

Acute toxicity studies: The acute toxicity of EECZ root and chloroform extract of root was determined as per the OECD guideline no. 423 (Acute Toxic Class Method) (OECD, 2002).

Selection of the extract: The chloroform and ethanol extract of *Capparis zeylanica* roots were evaluated for sedative-hypnotic activity in pentobarbitone induced sleep test.

Pentobarbitone induced sleeping time test: The animals were randomly divided into five groups consisting of six mice each. The test groups received ethanolic extract of *Capparis zeylanica* Lin. (EECZ) of 100, 200 and 400 mg kg^{-1} while positive control was treated with diazepam (1 mg kg^{-1} i.p.) and control with vehicle (1% Tween 80 in water). Thirty minutes later, pentobarbitone (40 mg kg^{-1}, i.p., Sigma Chemicals, USA) was administered to each mouse to induce sleep. The animals were observed for the latent period (time between pentobarbitone administration to loss of righting reflex) and duration of sleep (time between the loss and recovery of righting reflex) (Uddin *et al*., 2005).

Open field test: The open field test is used to study behavioral responses in mice that are placed in a novel and bright arena. Mice tend to avoid brightly illuminated areas. The test also measures a range of anxiety-induced, locomotor activity and exploratory behaviors. The animals were divided into control and test groups. The test groups received EECZ at the doses of 100, 200 and 400 mg kg^{-1} body weight orally whereas control group received vehicle (1% Tween 80 in water). 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 40 cm height a wall. The number of squares visited by the animals was counted for 3 min, on 0, 30, 60, 120 and 240 min during the study period.

Hole cross test: A steel partition was fixed in 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. The number of passages of a mouse through the hole from one chamber to other was counted for a period of 3 min on 0, 30, 60, 120 and 240 min after the oral treatment with EECZ at the doses of 100, 200 and 400 mg kg^{-1}.

Antinociceptive activity study: Nociception effect on ethanolic extract was studied using acetic acid induced writhing model in mice. Animals were kept on fast for an overnight; the animals were divided into control, positive control and test groups containing six mice in each group. The animals were fed with EECZ at the doses of 100, 200 and 400 mg kg^{-1} body weight, reference drug

(diclofenac Na) and control vehicle 45 min before i.p. administration of 0.7% acetic acid. After five minutes of interval and adequate absorption of acetic acid, the mice were observed for specific contraction of body referred as writhing, which is an indication of pain sensation in test animals. A comparison of writhing was made between positive control, control and test sample.

Statistical analysis: Statistical analysis (Woodson, 1987) Results are expressed as the Mean±SEM. ANOVA followed by Student's t-test was performed as a post hoc test of significance taking vehicle treated animals as control. $p<0.05$ was considered significant.

RESULTS

This dried ethanolic extract of root was examined chemically and was observed to contain alkaloids, steroids, phytosterol, fatty acids, phenols, flavonoids, flavonols, tannins and mucilage. These constituents were confirmed using thin-layer chromatography (TLC) and screening with various reagents. A weighed amount of the dried ethanolic and chloroform extracts of Capparos zeylanica root was suspended in 1% aqueous Tween 80 solution and used for the present study.

In toxicity study it was observed that the ethanolic extract was not mortal even at 2000 mg kg^{-1} dose. Hence, 1/20th (100 mg kg^{-1}), 1/10th (200 mg kg^{-1}) and 1/5th (400 mg kg^{-1}) of ethanolic extract dose were selected for further study (OECD, 2002). With chloroform extract, there was no mortality at dose of 1000 mg kg^{-1}. Hence, 1/20th (50 mg kg^{-1}), 1/10th (100 mg kg^{-1}) and 1/5th (200 mg kg^{-1}) of chloroform extract dose were selected.

The ethanolic extract (100 mg kg^{-1}, 1/20th of 2000 mg kg^{-1} dose) having significant ($p<0.05$) duration of action as compared to the control and no significant effect was observed with the corresponding dose of chloroform extract (1/20th of 1000 mg kg^{-1} dose). The EECZ (100 mg kg^{-1} p.o.) as showing long duration of sleep as compared to the chloroform extract (50 mg kg^{-1}p.o.) (60.50±1.03 min, 43.66±0.16 min as compared to control 45.60±1.36 min at $p<0.05$) (Table 2).

In the pentobarbitone induced hypnosis test, the EECZ at the doses of 100, 200 and 400 mg kg^{-1} significantly induced the sleep at an earlier stage and also prolonged the duration of action in test animals as compared to control. In the test animals, a significant increase in duration of sleep was observed in the dosages of 100, 200 and 400 mg kg^{-1} (60.5±1.03, 73.4±1.07, 97.3±1.34 min, respectively, as compared to 45.6±1.36 min in the control group at $p<0.05$). A significant decrease in onset of action was also observed in the dosage of 200 and 400 mg kg^{-1} (5.8±0.37 min, 3.8±0.68 min as compared to 7.4±0.50 min in the control group at $p<0.05$). The effect obtained with EECZ (400 mg kg^{-1} p.o.) was comparable with the standard drug (Diazepam 1 mg kg^{-1} i.p.) (97.3±1.34a, 98.4±1.23 min at $p<0.05$). The results were dose dependent and statistically significant (Table 1).

In the open field test, the EECZ showed a noticeable decrease in locomotion in the test animals from the third observation period at all dose levels (100, 200 and 400 mg kg^{-1} body weight). The effect observed was increasing with time and a noticeable result was found after 60 min of administration of EECZ. Test animals showing significant decrease in number of movement in the dosages of 100, 200 and 400 mg kg^{-1} (71.2±1.4, 60.2±1.3, 57.0±3.2, respectively, as compared to 96.2±1.9 in the control group at $p<0.05$) after 60 min of administration of EECZ. Similarly the effect was also observed after 120 and 240 min (65.1±1.8, 57.1±1.6, 46.4±3.5 as compared to control 103.3±1.5 and 44.5±4.1, 44.5±3.9, 44.5±4.2 as compared to 105.2±1.5 in the control group at $p<0.05$) EECZ. The depressant actions were slowly reduced with the time (Table 3).

Table 1: Effect of EECZ root on pentobarbitone induced sleeping time in mice

Treatment	Dose	Route of administration	Onset of sleep (min)	Duration of sleep (min)
Control (1% aq. Tween 80)	10 mL kg^{-1}	p.o.	7.4±0.50	45.6±1.36
EECZ	100 mg kg^{-1}	p.o.	6.2±0.37[b]	60.5±1.03[a]
	200 mg kg^{-1}	p.o.	5.8±0.37[a*]	73.4±1.07[a]
	400 mg kg^{-1}	p.o.	3.8±0.68[a**]	97.3±1.34[a]
Diazepam	1 mg kg^{-1}	i.p.	3.5±0.57[a**]	98.4±1.23[a]

[a]p<0.001 [b]p<0.01 [c]p<0.05 vs. control, Student's test; Values are Mean±SE (n = 6). i.p: Intra peritoneal, p.o. : Peroral

Table 2: Effect of ethanolic and chloroform extract of *Capparis zeylanica* in pentobarbitone-induced sleep with minimum dose ($1/20^{th}$)

Pentobarbitone (40 mg kg^{-1}, i.p) 30 min Post treatment of (min) the vehicle and drugs	Dose	Rout of Admn.	Onset of action (min)	Duration of action (min)
Control	10 mL kg^{-1}	p.o.	7.40±0.50	45.60±1.36
Chloroform extract	50 mg kg^{-1}	p.o.	7.82±0.16	43.66±0.16
Ethanolic extract	100 mg kg^{-1}	p.o.	6.20±0.37	60.50±1.03[a]

All values are Mean±SEM, [a]p<0.05 when compared with control. p.o: Per oral

Table 3: Effect of EECZ on open field test in mice

		Number of movements				
Treatment	Dose (p.o)	0 min	30 min	60 min	120 min	240 min
Control (1% aq. Tween 80)	10 mL kg^{-1}	86.4±2.0	93.5±1.8	96.2±1.9	103.3±1.5	105.2±1.5
EECZ root	100 mg kg^{-1}	85.3±1.6[a]	72.4±1.3[a]	71.2±1.4[a]	65.1±1.8[a]	44.5±4.2[a]
	200 mg kg^{-1}	85.3±1.6[a]	71.4±1.2[a]	60.2±1.3[a]	57.1±1.6[a]	44.5±4.1[a]
	400 mg kg^{-1}	85.1±2.0[a]	70.0±1.6[a]	57.0±3.2[a]	46.4±3.5[a]	44.5±3.9[a]

[a]p<0.001 [b]p<0.01 [c]p<0.05 vs. control, Student's t-test; Values are Mean±SE (n = 6)

Table 4: Effect of EECZ on hole cross test in mice

		Number of movements				
Treatment	Dose (p.o)	0 min	30 min	60 min	120 min	240 min
Control (1% aq. Tween 80)	10 mL kg^{-1}	8.4±0.64	9.5±0.44	10.1±0.49	9.6±0.69	8.6±0.66
EECZ root	100 mg kg^{-1}	7.3±0.69[a]	5.1±0.41[a]	5.2±0.44[a]	3.5±0.41[a]	2.1±0.31[a]
	200 mg kg^{-1}	8.0±0.67[a]	5.1±0.41[a]	4.6±0.38[a]	3.0±0.42[a]	1.8±0.24[a]
	400 mg kg^{-1}	8.5±0.66[a]	5.0±0.49[a]	4.1±0.31[a]	2.3±0.43[a]	1.5±0.21[a]

[a]p <0.001 [b]p <0.01 [c]p <0.05 vs. control, Student's t-test; Values are Mean±SE (n = 6).

In the hole-cross test, the EECZ also showed a decrease in locomotion in the test animals from the second observation period at both dose levels (100, 200 and 400 mg kg^{-1} body weight). The number of passage through hole from one chamber to another chamber was reduced significantly in the treated group in all the dosages of EECZ 100, 200 and 400 mg kg^{-1} (5.2±0.44, 4.6±0.38, 4.1±0.31 as compared to 10.1±0.49 at $p<0.05$) after 60 min of administration of EECZ. After 120 and 240 min also the effect was observed (3.5±0.41, 3.01±0.42, 2.3±0.43 as compared to control 9.6±0.69 and 2.1±0.3, 1.8±0.24, 1.5±0.21 as compared to control 8.6±0.66 at $p<0.05$) (Table 4).

In acetic acid induced writhing test, the EECZ significantly and dose dependently suppressed the frequency of acetic acid induced writhing in mice. At the dose 100 mg kg^{-1} body weight the EECZ showed 37.07% writhing inhibition, at 200 mg kg^{-1} body weight the EECZ showed 44.44% where as at 400 mg kg^{-1} body weight the EECZ produced 49.07% writhing inhibition, which is

Table 5: Effect of EECZ on acetic acid induced writhing in mice

Treatment	Dose (mg kg^{-1})	Route of administration	Writhings**	% of writhing inhibition
Control (1% aq. tween 80)	10 mL kg^{-1}	p.o.	21.6±1.20	100.00
Diclofenac-Na	25 mg kg^{-1}	p.o.	11.0±1.93^{a}	49.07
EECZ	100 mg kg^{-1}	p.o.	13.0±1.72^{a}	37.07
	200 mg kg^{-1}	p.o.	12.0±1.88^{a}	44.44
	400 mg kg^{-1}	p.o.	11.0±2.00^{a}	49.07

**Administered 45 min before 0.7% acetic acid administration (10 mL kg^{-1}, i.p.). Counted for 15 min, starting 5 min after acetic acid administration, $^{a}p<0.001$ $^{b}p<0.01$ $^{c}p<0.05$ vs. control, Student's t-test; Values are Mean±SE (n = 6)

comparable to a standard drug and all the result are statistically significant ($p<0.001$) (Table 5). Diclofenac Na, used as the positive control exhibited a writhing inhibition of 49.07% as compared to control and the result was statistically significant ($p<0.05$).

DISCUSSION

The roots of *C. zeylanica* were reported to have antibacterial, antioxidant activities; it also found to act as endothelin receptor antagonists (Duke, 2000). Significant anti inflammatory and analgesic activity was exhibited by the successive petroleum ether, methanol and aqueous root extracts of *C. zeylanica* at doses of 30 and 60 mg kg^{-1}; in both cases, the methanol extract exhibited the best activity (Chaudhary *et al*., 2004).

The 50% alcoholic extract of aerial parts reported as spasmolytic (Chopra *et al*., 1999). The ethanol and water extracts of Capparis zeylanica leaves showed dosedependent and significant ($p<0.05$) increases in pain threshold in tail-immersion test. Moreover, both the extracts (100-200 mg kg^{-1}) exhibited a dose-dependent inhibition of writhing and also showed a significant ($p<0.001$) inhibition of both phases of the formalin pain test (Ghule *et al*., 2007). The water extract (200 mg kg^{-1}) significantly ($p<0.01$) reversed yeast-induced fever in rodents. *Capparis zeylanica* plant extracts were evaluated for *in vitro* antioxidant activities. Antioxidant properties of methanolic extracts of raw floral buds have been shown in various *in-vitro* models and the potential use in oxidative stress-based pathological conditions has been suggested (Hamed *et al*., 2007).

The results of the present series of experiments show that *Capparis zeylanica* root extract displays a behavioral profile that is consistent with an anxiolytic and CNS depressant action. The study showed that EECZ possess sedative activity and is found to potentiated the sleep induced by pentobarbitone suggesting that it possess some sleep inducing property also. Furthermore, potentiation of pentobarbitone-induced sleep strongly suggests central depressant activity of this extract (Nuhu *et al*., 2008).

A chemical analysis conducted by using several reagents and TLC analysis for EECZ extracts showed that EECZ contains the alkaloids, steroids, phytosterol, fatty acids, phenols, flavonoids, flavonols, tannins and mucilage etc. It has been reported that some flavonoids bind with high affinity to the benzodiazepine site of the GABA a receptor (Kahnberg *et al*., 2002). It is possible that the presence in EECZ of several flavonoids, could account for its effects on the CNS (Fernandez *et al*., 2004).

Despite its intensive use in traditional Indian medicine as a sedative, *Capparis zeylanica* extract has not yet been evaluated for its activity toward the CNS. The present study investigated the putative CNS effects of an alcoholic extract of the roots of *Capparis zeylanica* (EECZ) in mice. The extracts were selected depending on duration of sleep produced by ethanolic and chloroform extract of *Capparis zeylanica* in pentobarbitone induced sleeping animals. Ethanolic extract

(100 mg kg^{-1}) was found effective as compared to the control and no significant effect was observed with chloroform extract (50 mg kg^{-1}) (Table 1). The results showed that EECZ exerts depressant effects on the CNS.

Although EECZ per se did not induce sleep, the animals treated with the extract were found to be awkward, calm and relaxed. Nevertheless, acute administration of AECM at single doses of 100, 200 and 400 mg kg^{-1} 60 min before the administration of pentobarbitone resulted in decreased sleeping latency and increased sleeping time.

In vivo methods using intact animals are considered to be the best method for investigating the action of drugs on the CNS. The most important step in evaluating drug action on the CNS is to observe the behaviour of the test animals. To obtain meaningful results regarding the effect of EECZ on the CNS in mice, a number of methods namely pentobarbitone-induced hypnosis, open field, hole cross and acetic acid induced writhing tests were adopted. In the pentobarbitone induced hypnosis test, EECZ at the doses of 100, 200 and 400 mg kg^{-1} body weight, dose dependently induced sleep at a rapid stage as compared to control and increased the duration of sleep (Table 2). The effect of EECZ (400 mg kg^{-1} p.o.) was comparable to the effect of diazepam (1 mg kg^{-1} i.p.), a classical benzodiazepine (Table 2). The sedative and anxiolytic effects of EECZ could be due to the interaction of flavonoids (chemical constituent of the plant) with the GABA/benzodiazepine receptor complex in brain (Trofimiuk *et al*., 2005). Pentobarbitone, a barbiturate type of hypnotic agent, when given at appropriate dose, induces sedation or hypnosis in animals by potentiating the GABA mediated postsynaptic inhibition through an allosteric modification of GABA receptors (Goodman and Gilmans, 2001). Substances that have CNS depressant activity either decrease the time for onset of sleep or prolong the duration of sleep or both. The results obtained in this test, indicate that the EECZ might have depressant action on the CNS. An important step in evaluating drug action on CNS is to observe its effect on locomotor activity of the animal. The EECZ significantly decreased the locomotor activity as shown by the results of the open field and hole-board tests. The locomotor activity lowering effect was evident at the 3rd observation (60 min) and continued up to 5th observation period (240 min) (Table 3). Thus decreased spontaneous motor activity and potentiation of pentobarbitone induced sleep could be attributed to the CNS depressant activity of the EECZ. Moreover, the validation of anxiety was carried out by measuring external signs, through hole cross and evasion tests. In the hole cross experiment, the depressing action of the EECZ was evident from the second observation period in the test animals at the doses of 100, 200 and 400 mg kg^{-1} body weight. Maximum depressant effect was observed from 4th (120 min) to 5th (240 min) observation period. The results were also dose dependent and statistically significant (Table 4). The EECZ, at the doses of 100, 200 and 400 mg kg^{-1} body weight showed significant and dose dependent decrease in the acetic acid induced writhing in mice and the results followed a dose dependent response (Table 5). Intraperitoneal administration of acetic acid causes algesia by liberating noxious endogenous substances including serotonin, histamine, prostaglandin, bradykinin and substance P that sensitize pain nerve endings (Collier *et al*., 1968; Raj, 1996). Of the rostanoids, mainly prostacycline has been held responsible for the causation of pain following acetic acid administration (Trofimiuk *et al*., 2005). It has been suggested that acetic acid stimulates the vanilloid receptor and bradykinin B2 receptor in the pathway comprising sensory afferent C-fibers (Murata *et al*., 1997). The reason behind the observed activity of the EECZ, may be due to the effect of the extract in decreasing the synthesis and/or release of those endogenous substances or depressant effect of the extract on the nerve fibers involved in the pain transmission pathway. Finally overall results obtained from this study showed CNS depressant

activity of the EECZ on experimental animal models. EECZ 400 mg kg^{-1} dose showed more prominent depressant activity than the 100 and 200 mg kg^{-1} dose. The mechanism of this depression is not clearly understood at this point, but it can be assumed that the drug may exert CNS depressant effect by interfering with the function of cortex.

CONCLUSION

This study demonstrates that an acutely administered single dose of an alcoholic extract of Capparis zeylanica Lin. root have depressant effects on the central nervous system. These findings are in agreement with the traditional use of Capparis zeylanica Lin. root as sedative and analgesic remedy.

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