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Cardamom Oil- An Essential Oil in the Treatment of Generalized Anxiety Disorder

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A B S T R A C T

The study was planned with a rationale to investigate the anxiolytic potential of Cardamom oil (50mg/kg) against experimentally induced anxiety model such as Light and Dark Box transition test in albino rats. The control, test (Cardamom oil, 50mg/kg) and standard (buspirone 1 mg/kg) treated rats are placed in the center of light and dark box apparatus one by one with head facing towards dark box and the preference of animals towards dark and light box are noted for a period of 5 minutes. The behavioral parameters that were recorded are time spent in light box, time spent in dark box and number of entries in light and dark box. The cardamom oil (50mg/kg) showed significant anxiolytic activity in albino rats by increasing in time spent by the animals in light box (197.33±52.78 sec) when compared to the control rats (19± 9.262 sec) in the light and dark box apparatus. Hence it can be concluded that cardamom oil (50mg/kg) exhibits anxiolytic activity. Phytochemical screening of cardamom oil reveals the presence of steroid, oil, fats and carbohydrates. Hence the above mentioned active constituents of cardamom oil may be involved in its anxiolytic potential.

Keywords: cardamom oil, anxiolytic potential, light and dark box & buspirone.

A R T I C L E I N F O

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1. Introduction

Anxiety is an unpleasant state of the body but it is also a necessary response[1]. It is characterized by uneasiness, fear or apprehension, nervous behavior and somatic complaints. Anxiety is a protective phenomenon unless and until it

remains mild[2]. Severe forms of anxiety often lead to depression followed by psychological disturbances[3]. Common treatment for anxiety includes medication, life style changes and pyschotherapy[4].Anxiety can occur as short term state or long term trait[5]. Cardamom oil is particularly helpful for the digestive system. It works as a laxative and soothes colic, wind, dyspepsia and nausea - even nausea in pregnancy. It warms the stomach and helps with heartburn. When feeling weak and mentally fatigued, cardamom oil can help with its refreshing and uplifting effect[6]. However there are no *in-vivo* studies till now to establish the anxiolytic potential of cardamom oil. Hence the present study was designed to evaluate anxiolytic potential of cardamom oil by using light and dark box transition test in rats.

2. Materials and Methods

For the present study, the cardamom oil was purchased from DF Pharmacy limited at FP No.17&16/5, meldi estates at gota, Ahmedabad, Gujarat, India. The stock solution of cardamom oil was prepared by using 2% acacia solution and is used for as a suspension for phytochemical screening and in-vivo studies. Standard drug buspirone was collected from Microlabs, Bangalore and is suspended in 2% acacia solution.

Figure 1: Cardamom oil (DF Pharmacy Ltd. Gujrat, India)

Preliminary phytochemical screening[7]

Preliminary phytochemical tests were performed for the cardamom oil to detect the presence of phytochemicals by following the standard methods described in the practical pharmacognosy of kokate and khandelwal. The results have been tabulated in table I.

Experimental animals: Albino rats (125-310 gm) were used for the present research. They were procured from sainath agencies, musheerabad. After randomization into various groups and before initiation of experiment, the rats were acclimatized for a period of 15 days. Animals were housed in polypropylene cages and maintained under standard environmental conditions such as temperature (26 ± 2ºc), relative humidity (45-55%) and 12hr dark/light cycle. The animals were fed with rodent pellet diet (Golden Mohur Lipton India Ltd.) and water *ad libitum.* The study protocol was approved from the institutional animal ethics committee (IAEC) before commencement of experiment (1292/ac/09/CPCSEA).

Determination of acute toxicity

Doses of cardamom oil (50 mg/kg) and Buspirone (1mg/kg) was selected for the present anxiolytic study in accordance with the literature findings[8, 9].

Evaluation of Anxiolytic Potential of cardamom oil (50mg/kg) in albino rats by using Light and dark box apparatus: The light and dark box apparatus consists of two compartments chamber (40x60x20cm) comprising of a brightly illuminated area (40x40cm) and dark area (40x20cm) separated by a wall hole (7cm diameter). Control rats were placed individually in the illuminated part of the cage and following parameter were recorded during the test session of 5 minutes.

- Time spent in light box.
- Time spent in dark box
- Total number of entries in light and dark box during 5min session.

Repeat the same procedure for test and standard group rats, after 1hr of administration of cardamom oil (50mg/kg) and buspirone (1mg/kg) and the above parameters were recorded.

Figure 2: Light and Dark Box apparatus for anxiolytic study in rats

Statistical Analysis

The values are represented as mean ± S.E.M, and statistical significance between treated and control groups was analyzed using One way ANOVA, Followed by Dunnett's test where $P<0.001$, $P<0.01$ and $P<0.05$ was considered statistically significant.

Table 1: Preliminary Phytochemical screening of cardamom oil

Phytoconstituents	Cardamom oil (50 mg/kg)
Carbohydrates	+
Steroids	+
Glycosides	-
Flavonoids	-
Oil and fat	+

- Absent + Present

3. Results and Discussion

In Light and dark Box transition test the time spent by control treated rats in illuminated light box (19±9.262 sec) was less than in the dark box (274± 9.815 sec) indicating the presence of anxiety in experimental rats. However the time spent by the Cardamom oil (50 mg/kg) treated test rats in light box (197.33± 52.78 sec) was significantly more

than time spent in dark box (101.33± 51.45 sec) indicating the decrease in anxiety of the animals when compared to control group. However when compared to the time spent by the Buspirone (1mg/kg) treated rats in the light box (286 ± 14.0 sec), cardamom oil treated rats exhibits lesser time spent in light box (197.33± 52.78 sec) indicating that cardamom oil has lesser anxiolytic efficacy than standard buspirone. However when compared to the control rats, cardamom oil treated test rats possesses significant anxiolytic activity. It is evident from the literature that steroids posseses significant anxiolytic activity[10]. Hence steroids present in cardamom oil may be responsible for their anxiolytic potential. Further it is required to isolate the active constituents from the cardamom oil and to study individual active ingredients thoroughly.

Table 2: Control: (Distilled water p.o)

S.No	Body Weight (g)	No.of enteries in Light box	No. of enteries in dark box	Time spent in dark box(sec)	Time spent in light box(sec)
1	240	2	3	257	34
2	185	1	2	274	20
3	220	0	1	291	2
	Average	**1±0.577**	**2±0.577**	**274±9.815**	**19±9.262**

***P<0.001, **P<0.01 and * P<0.05 was considered statistically significant.

Table 3: Test (cardamom oil 50mg/kg)

S.No	Body weight(g)	No.of enteries in Light box	No.of enteries in dark box	Time spent in dark box(sec)	Time spent in light box(sec)
1	310	2	2	44	256
2	240	2	2	20	92
3	275	1	1	56	204
	Average	**1.66±0.33**	**1.66±0.33**	**101.33±51.45****	**197.33±52.78*****

***P<0.001, **P<0.01 and * P<0.05 was considered statistically significant.

Table 3: Standard Group: (Buspirone 1mg/kg)

S.No	Body weight(g)	No. of enteries in Light box	No .of enteries in dark box	Time spent in dark box(sec)	Time spent in light box(sec)
1	130	0	0	0	300
2	170	0	0	0	300
3	125	3	3	3	258
	Average	**1± 1.0**	**1± 1.0**	**7.6± 2.43*****	**286±14.0*****

***P<0.001, **P<0.01 and * P<0.05 was considered statistically significant.

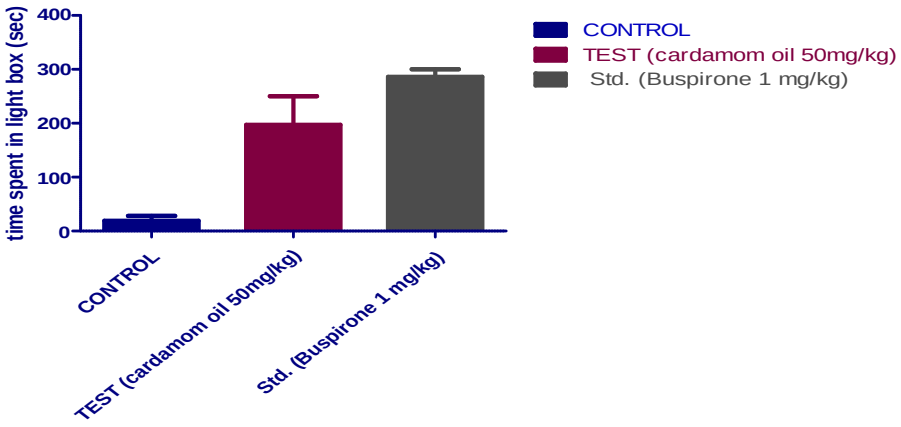

Figure 3: Anxiolytic activity of Control, test (Cardamom oil 50mg/kg) and Standard (Buspirone 1 mg/kg)

4. Conclusion

Based on the results of the present study, we conclude that cardamom oil (50 mg/kg) has significant anxiolytic activity. Cardamom oil at dose 50 mg/kg has significantly increased the time spent by the rats in illuminated light box when compared to control rats indicating the inhibition of anxiety in rats. The exact mechanism behind anxiolytic potential of cardamom oil is not understood by the present research. However it can be hypothesized that cardamom oil can produce a hyperpolarizing effect in rat brain neurons probably by enhancing the effects of GABA. Further

studies are essential to isolate the active constituents of cardamom oil and to investigate the exact anxiolytic mechanism of cardamom oil.

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