

Short Communication

Anxiolytic activity of *Tribulus terrestris* on elevated plus maze

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ABSTRACT

Tribulus terrestris widely used in Asian countries as soothing effect and decoration especially in festivals and has brain calming effect and it reduces behavior related anxiety and psychic behavior in rodents also. *Tribulus Terrestris* extract produce significantly increase time spent in the open arm of plus maze and rearing significantly increase in elevated plus mazes that shows reduction in anxiety behavior. Increase number of entries in open arm significantly shows anxiety relieving capabilities in treated NMRI mice.

INTRODUCTION

Depressive anxiety is one of the most common emotional disorders and treatment of phobias or panic attacks is still not trivial. Pharmacological therapies play an important role in the therapeutic concept. Benzodiazepines have been the most widely used anxiolytics in various practices for many years (Holm, 1988; Michelle et al., 2009) and are relatively safe drugs for a shortten treatment of anxiety disorder despite their drug dependence potential and side effects (Ballinger, 1990; Lader, 1999). Diazepam and buspirone are standard anxiolytic and also employed in behavioral pharmacology as the reference compound for an anxiolytic-like effect even if the screened drug is not acting via benzodiazepine receptors.

In the conventional form of the test, anxiety is generally assessed by measures of open arm avoidance while locomotor activity is most reliably measured by the frequency of closed arm entries. The elevated plus maze (Plus), with two adjacent closed arms perpendicular to two open arms, has been validated by use of pharmacological (Lister, 1987; Pellow et al., 1985; Pellow and

File, 1986) and behavioral (Lister, 1987; Pellow et al., 1985) manipulations in rodents. Time spent in open areas is frequently reported as spent time of treated mice in open arm compared to control mice, time spent in the closed and open areas, thereby significantly high in the central region from anxiety analysis (Hogg, 1996).

MATERIALS AND METHOD:

The behavioral parameters measured number of entries into the open arms that shows anxiety like behavior, time spent on the open arms, All performed procedures and experiments were approved by the Ethical committee of Pharmacology and Herbal Sciences, Hamdard University, Karachi.

Plant Collection and Authentication

Tribulus terrestris leaves were collected at the Botanical garden of the Hamdard University. The leaves were identified and authenticated from Eastren Medicine Department of Hamdard University.

Extraction

The *Tribulus terrestris* leaves were air-dried, pulverized and 1000 g was macerated for 72 h in 1 L of 50% methanol. It (the ethanol) was decanted, filtered several times using cotton wool and Whatman's No.1 filter paper and concentrated using rotary

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evaporator at the Pharmacology Laboratory of Hamdard University. The percentage yield was 45.12g extraction from the 1000 g of dried pulverized leaves. On each day of experiment, the dark green colored extract obtained was freshly dissolved in 5% Tween 80 (vehicle) which used as vehicle.

Elevated Plus Maze

Locally fabricated elevated plus maze consisting of two open arms (35×6 cm) and two enclosed arms ($35 \times 6 \times 15$ cm) was used. The maze was elevated to the height of 40 cm. Mice were placed individually in the center of the EPM facing an enclosed arm. The time spent by the mouse during the next 05 min on the open and enclosed arm was recorded. The animals received vehicle (10 ml/ kg) or PB (100, 200 and 400 mg/kg) 60 min before and diazepam (1 mg /kg i.p) 30 min before their placement on the maze. Increased exploratory activity in the open arm was taken as an indication of anxiolytic activity (Lister,1987; Kulkerni, 1993).

RESULTS

Methanolic extract of *Tribulus terrestris* was evaluated against anxiety using elevated plus maze test. (n=6)Three parameter was observed in mice during the test 1) Rearing 2) Time spent in open arm of elevated plus maze and 3) Number of entries in open arm the results were analysed using Student t-tests (two-tailed).

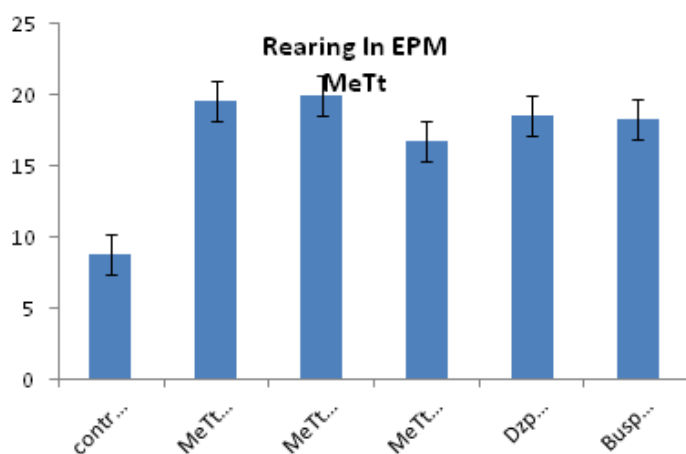


Fig. 1: Shows rearing (mean \pm SEM n= 6) of mice in elevated plus maze test (EPM). The control, and various doses (i.p n= 6) methanolic extract of *Tribulus terrestris* (MeTt) diazepam (Dzp) and buspirone (Busp).

Methanolic extract of *Tribulus terrestris* (MeTt) induced of rearings in the elevated plus maze and the number of rearings were compared with control **Figure- 1**. The number of rearings induced by MeTt (50 –100 mg/kg i.p.) were significantly different ($p>0.005$) from control and diazepam and buspirone.

MeTt dose of (50-100 mg/kg ip) treated mice spent ~ two fold increase in the time (seconds) in open area as compare to control animals ($p>0.005$) **Figure-2**. Whereas MeTt dose at same dose caused non significant differences were observed among diazepam and buspirone.

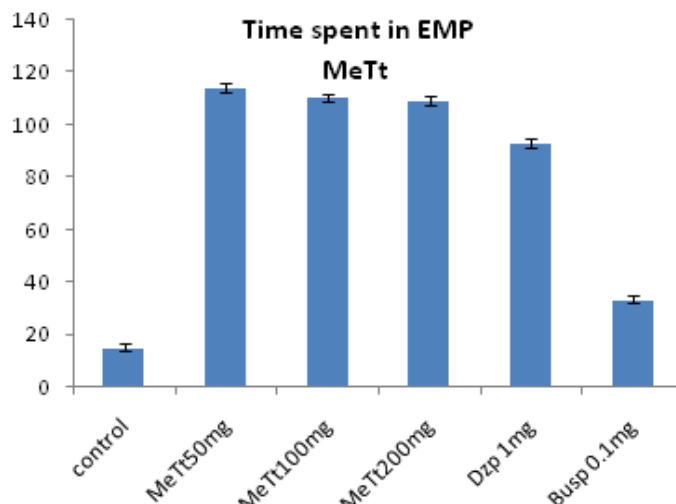


Fig. 2: Shows the time spent (mean \pm SEM n= 6) by mice in elevated plus maze test (EPM) in open arm . The control, and various doses (i.p) of methanolic extract of *Tribulus terrestris* (MeTt) diazepam (Dzp) and buspirone (Busp).

MeTt treated mice exhibited dose significant dependent increase in number of entries in open area with respect to control **Figure-3**. Whereas non significant differences were observed among diazepam and buspirone.

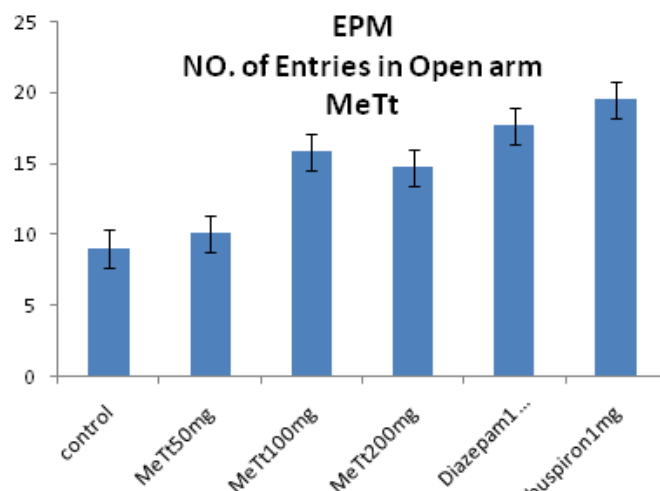


Fig. 3: Shows the number of entries of mice in open arms (mean \pm SEM n= 6) of elevated plus maze test (EPM). The control, and various doses (i.p) of methanolic extract of *Tribulus terrestris* (MeTt) diazepam (Dzp) and buspirone (Busp).

DISCUSSION

Diazepam is used as a standard anxiolytic and has been frequently employed in behavioural pharmacology as a reference compound to potentially anxiolytic-acting substances (Taukulis and Goggin, 1990; Guimaraes et al., 1990; Wright et al., 1992) and buspirone used to treat the psychic behavior in rodents. An increase of the time spent in open arm shows relieve of anxiety significantly ($p<0.005$) and the proportion of the entrances into the open arms without a changed locomotor activity is regarded as a strong marker for an “anxiolytic” substance effect (Pellow et al.,

1985) and increase in rearing shows free from fear behavior in rodents. There is a variety of animal tests for the investigation of “anxiolytic” or “anxiogenic” effects of substances (Stephens and Andrews, 1991). The elevated plus maze is a well-established animal test causing a fear status by comprehensible stimuli and the use of innate behaviours of the animals, is one of the most widely used models to assess anxiety in small rodents (Hogg, 1996) and is a validated and reliable test for detecting both anxiolytic and anxiogenic like effects of agents (Pellow and File, 1986; Rodgers and Cole, 1994).

CONCLUSION

It is concluded that the Methanolic extract of *Tribulus terrestris* possess anti-anxiety activity on elevated plus maze.

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