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EVALUATION OF ANTI-ANXIETY ACTIVITY OF *FICUS RACEMOSA FRUIT ON MICE*

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ABSTRACT

Anxiety disorders are increasingly being recognized as a global problem affecting all age groups, which are characterized by a variety of neuroendocrine, neurotransmitter, and neuroanatomical disruptions. Anxiolytic drugs have higher effect sizes than psychosocial therapies and show effect in a shorter time; however, they have an unfavourable risk/benefit ratio, as they produce anterograde amnesia, dependence, abstinence syndrome, paradoxical reactions in humans, and decay of psychomotor functions. The present investigations validate the traditional use of Ficus racemosa fruit as nerve soother, and conclude that the fruit has great potential for being developed as an effective antianxiety agent.

KEYWORDS: Ficus racemosa, EEFR (ethanolic extract of ficus racemosa), EPM (Electronic plus maze model).

INTRODUCTION

Today, stress or anxiety are commonly used terms that may occur when an individual is subjected to an aversive external (physical/mental) stimulus. Anxiety could be an adaptive tool for motivating the animal or human to change and grow or quickly find away of escaping or terminating this source of initial anxiety. The latter responses are known as the fight-or-flight responses which are conserved across species wherein escaping from the imminent danger is of paramount importance. In certain cases, the response to anxiety can persist even after removal of withdrawal of stimulus. It can become maladaptive and pathologic if it is uncontrollable, excessive, inappropriate, andpersists without reason for a longer period (typically lasting more than six months). The symptoms are quite discomforting and can

effectively interfere with a person's ability to perform daily tasks. Anxiety disorders are increasingly being recognized as a global problem affecting all age groups, which are characterized by a variety of neuroendocrine, neurotransmitter, and neuroanatomical disruptions. In addition to being highly prevalent, anxiety disorders tend to co-occur frequently both among themselves and with other psychiatric and nonpsychiatric disorders.[1] In clinical and population- based studies, the development of comorbidities makes the treatment of primary and secondary disorders difficult, which contributes to poor prognosis, low remission rates, and risk of suicide.[2]

The earliest modern pharmacological treatment of pathologic anxiety was the application of sedating medications, barbiturates, and benzodiazepines, which targetthe inhibitory GABA receptors (Simon and Gorman, 2006).[3] These drugs are usually prescribed for a shorter period as they tend to develop a dependency, especially in people who have abused drugs and alcohol. It has been observed that people face withdrawal symptoms after discontinuation of benzodiazepines.

Overall, the anxiolytic drugs have higher effect sizes than psychosocial therapies and show effect in a shorter time; however, they have an unfavourable risk/benefitratio, as they produce anterograde amnesia, dependence, abstinence syndrome, paradoxical reactions in humans, and decay of psychomotor functions. Despite thewidespread availability of psycho- and pharmaco-therapies and the increasing consumption of anxiolytic drugs, there is still a great need for studies to identify novel alternatives with better pharmacological profile than the current therapeutic arsenal. Moreover, multidisciplinary studies on basic mechanisms underlying anxiety disorders should contribute to the identification of new targets and the design of novel drugs. Therefore, there is an urgent need to develop broadly acting,more effective anxiolytics with a rapid onset of action, that are better tolerated andwith limited abuse potential. In this regard, medicinal plants, which appear as sources of neuroactive molecules.

MATERIALS AND METHODS

Collection, identification and authentication of plant material: The fresh Fruit of *Ficus Racemosa* L. were collected from local region and was authenticated by Dr. C. S. Swami, Associate professor and Head of Botany Dayanand Science Collage Authentication of plant *Ficus Racemosal*. was done by specimen Collection, authentication, identification, processing and storage had been done according to standard procedure for theplant material

Extraction of plant material: The fresh Fruit of *Ficus racemosa l* were subjected to shade drying and further crushed to coarse powder passed through mesh no. 14 and stored inair tight container for further use Dried powdere of fruit was successfully extracted with ethanol by Soxhlet extractor apparatus according to the standard method till colorless solution was observed in siphontube. 100 gm of the powdered plant and 400 ml ethanol was used for extraction. After completion of extraction extract was cooled & evaporated by using Superfit Rotary evaporator. The extract was stored in air tight container. % yield of extract was calculated.

Image No. 1: ***Ficus racemosa.***

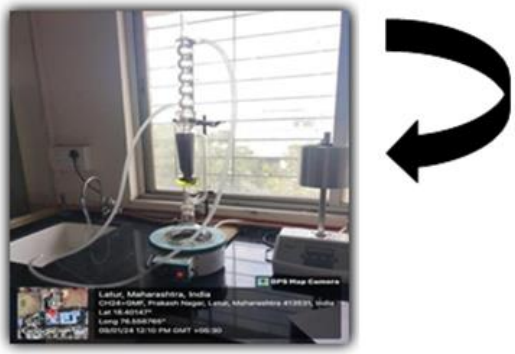


Image No. 3: Extraction of *Ficus racemosa* fruit powder by Soxhlet Appratus Animals: The study will be conducted in accordence with ethical guidelines and approved by the institutional animal ethics committee at Dayanand college of pharmacy, Latur [DCOP/IAEC/2023-24/15]. care will be taken to minimize animal suffering and adhare to principle of animal welfare. Albino mice of weight (25-35g) of either sex was used in the current study. Animals were procured from Crystal Biological solution Pune 412308, Maharastra reg no 2030/PO/RcBiBt/S/18/CCSEA The animals were housed in polypropylene cages, approximetely six per cage under conditions of controlled temperature (22+_26`C) and

humadity (50-60%) with a 12hr light/dark cycle and free access to water and the specificdiet. Animal were randomly assigned into five groups. group(I) Normal saline, group (II) Is the standard group of Diazepam (2Mg/kg) group (III) is the test drug i.e lowest dose of EEFR(50mg/kg), group(IV) EEFR(100mg/kg), group(V) highest test drug dose(200mg/kg).

METHODS

Phytochemical screening of extracts: The extracts obtained by successive extraction were subjected to qualitative tests for the identification of various secondary metabolites such as carbohydrates, proteins, tannins, steroids, flavonoids, alkaloids and glycosides.
Phytochemical examinations were carried out for all the extracts as per standard methods.

Evaluation of antianxiety activity

Elevated plus maze test: The elevated plus maze consist of two intersecting arms which are two open arms 35× 15 × 15 cm and two enclosed arms both 35 × 15 × 15 cm with an openroof, arranged so that the two open arms are opposite to each other the maze is elevated to a height of 50 cm and arm is 10 cm wide. the Albino Mice (20–25 gbody weight) were housed in pairs for 10 days prior to testing in the apparatus. During this time the mice were handled by the investigator on alternate days to reduce stress. Animals were divided into 4 groups of 6 mice. Control, Standard drug treated, and four extract treated group. (Higher & Lower)Sixty min after oral and 20 min after i.p. administration of the test & standard drug respectivly the Mice was placed in the centre of the maze, facing one of the enclosed arms.

Evaluation Parameters: The total number of entries in open arm, enclosed arm, Time spent by Mice in open & enclosed arms, by observing open arm examining time.

Dark And Light Model: Experimental animal groups used in the present study consisted of six mice in each group. All the instruments used in present study were fabricated from local market as per the standard dimensions available from scientific research. Mice were exposed to light–dark test for normal duration (5 min), sufficient to assess the anxiety levels in mice Behavioral tests were performed in independent groups of mice. Drugs were administered 30 min before the evaluations in the apparatus. Doses of ethanolic extract of *Ficus Racemisa* (100and 200 mg/kg) were selected on the basis of acute toxicity study according to OECD guidelines (up and down method) and the dose of diazepam was 0.5 mg/kg. The apparatus was thoroughly cleaned using 5% ethanol before placing each mouse in the cage.

RESULT

In- Vivo Anti- anxiety activity

Relative anxiolytic activity profiles (the mean number of entries in open arms, and the mean time spent by the mice in open arms after oral administration) of different doses (50, 100 or 200 mg/kg) of EEFR, and diazepam (2 mg/kg) and the control (vehicle) are shown in Table 1.

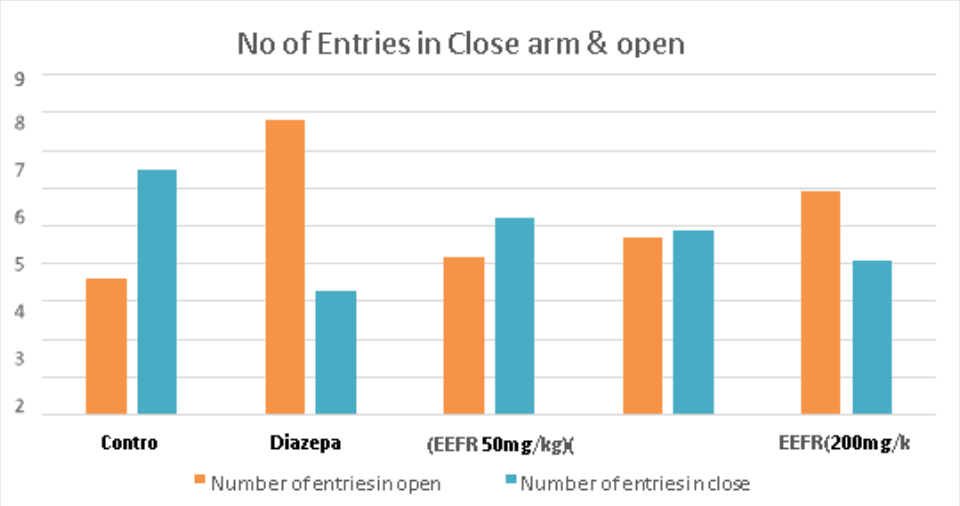
Table No. 1: *Ficus Racemosa* fruit extracts mean reading from Elevated plus maze test.

Group	Number of entries in open arm	Number of entries in close arm	Time spent in open arm(sec)	Time spentin close arm(sec)
I	3.6±0.8	6.5±1	32.4±1.4	95.5±18.8
II	7.8±2.4	3.33±1.7	78.1±2.3	36.1±2.7
III	4.2±0.5	5.2±0.33	38.1±1.2	72.3±4.8
IV	4.7±0.53	4.93±0.4	47.4±6.2	65.3±8.52
V	5.9±0.64	4.35±0.2	58.3±2.8	48.3±3.4

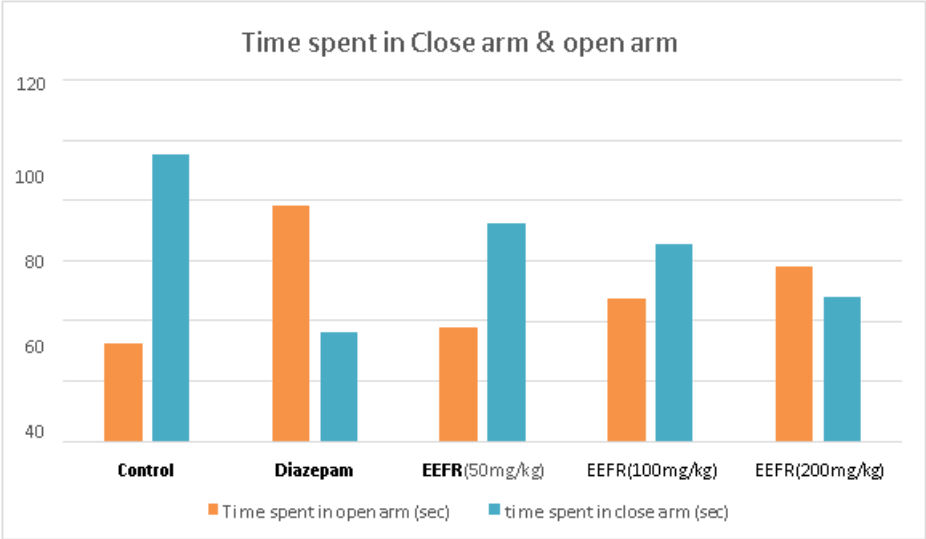
Each value represents the mean ± S. E. M (n=6)

*Significant difference when standard and test compound with control ($P < 0.05$);

**Highly significant difference when test compared with control ($p < 0.001$); ≠ No significant difference when test compared with standard



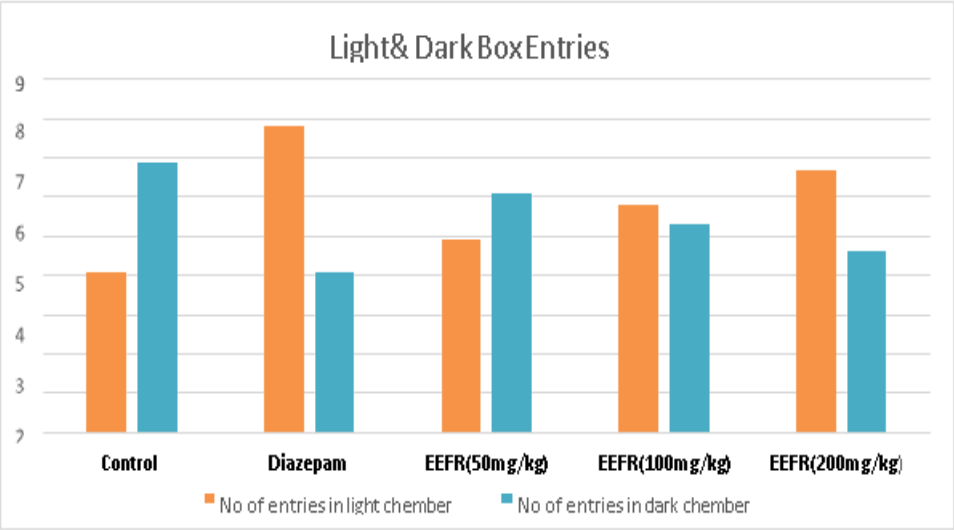
Graph No. 1: Total number of entries in open arm in elevated plus maze test.



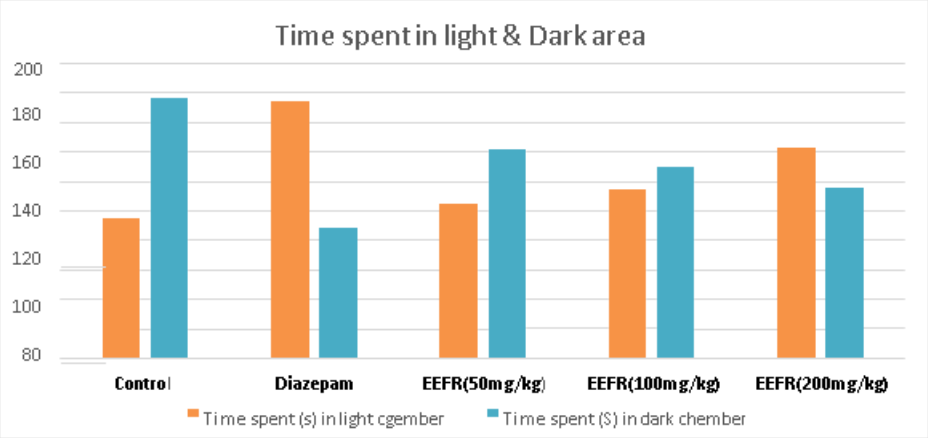
Graph No. 2: Time Spent in open arm (in sec) in elevated plus maze test.

Table No 2: *Ficus Racemosa* Fruit extracts mean reading from Light and Dark test.

Group	Number of entries in light chamber	Number of entries in dark chamber	Time spent in light chamber (sec)	Time spentin dark chamber (sec)
I	4.1±1.0	6.9±1.46	94.6±12.80	177.1±6.7
II	7.8±1.3	4.1±0.9	174.3±6.6	88.5±4.1
III	4.9±1.2	6.1±1.20	104.6±13.3	142.1±5.5
IV	5.8±0.89	5.3±1.08	115.1±12.8	129.8±0.5
V	6.7±0.77	4.1±0.9	142.7±6.8	115.6±4.5



Graph No. 3: Light and Dark box entries.



Graph No 4: Time spent in light and dark area.

DISCUSSION

According to World Health Organization, 80% of the people living in rural areas depend on medicinal herbs as primary healthcare system.

Ficus Racemosa Fruit Belongs to family of Mulberry. It is distributed throughout the world. It can be found in All Over the World. The Fruits are simple, Ovel in Shape, Brown In color. The Fruits are 2 to 3 cm long, 1to 2 cm wide with a broad base and pointed tip like an egg. Fruit, it has Brown, green, white.

The Fruit of *Ficus Racemosa* A fruit was identified and authenticated from Dayanand Science College, Latur and herbarium was submitted to Dayanand Science College, Latur. The collected Fruits were dried and used for extraction. Extraction was done by continuous hot method using Soxhlet apparatus. Ethanolic extract were obtained.

The anti-anxiety activity of ethyl acetate and ethanol extracts of Achyranthes aspera was studied by using elevated plus maze model. The obtained results were compared with standarddrug diazepam (2mg/kg).

In this model, rats were allowed to move in maze which consists of two open arms and enclosed arms for a period of 5min. Fear due to height induces anxiety in animals when placed in the maze. The anxiety and fear in animals are exhibited by decreases in locomotor activity and preference to be at safter places. Parameters like number of entries in open arm and closed arm, time spent in open arm, closed arm. These parameters were Observed.

The results showed that the higher dose (200mg/kg) of both extracts, have highly significant

anti-anxiety activity. It was observed that Ethyl acetate and ethanol extracts of plant show significant difference as compared to vehicle treated group, and shows same behavioural effects produced by standard drug diazepam.

From the results it was observed that ethanol extracts showed effective anti-anxiety activity.

CONCLUSION

Ethanol extract of *Ficus racemosa fruit* exhibited significant antianxiety activity in mice on EPM. Antianxiety activity guided fractionation of the extract led to isolation of Alkaloid, saponin flavonoid, tannin the compound responsible for antianxiety activity of the fruits. EEFR (200mg/kg) was found to manifest significant antianxiety activity in a variety of models – EPM, open field, mirror chamber, light/dark, hole board all differing in their mode of anxiety induction. The activity was observed to be comparable to that of standard anxiolytic drug diazepam (2 mg/kg, ip). Study of mechanism of action of action showed that the compound might be manifesting antianxiety activity through GABAA receptors. The Present investigations validate the traditional use of *Ficus racemosa fruit* as nerve soother, and conclude that *Ficus racemosa fruit* has great potential for being developed as an effective antianxiety agent. This is the first report on antianxiety activity of *Ficus racemosa fruit*.

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