

Anxiolytic Activity of hydro-alcoholic extract of roots of *Sarcostemma acidum* (Roxb.) Voight

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Abstract

The present study was aimed to investigate anxiolytic property of hydro-alcoholic extracts of roots of *Sarcostemma acidum*. The anxiolytic activity was evaluated with the adult mice by the light–dark box test, and motor coordination with the rota rod test. The efficacy of the root extract at the dose of 200 and 400 mg/kg was compared with the standard anxiolytic drug diazepam (1 mg/kg i.p.) The results indicate that extract increased the time spent in the brightly-lit chamber of the light/dark box, as well as in the number of times the animal crossed from one compartment to the other.

Keyword: *Sarcostemma acidum*, Diazepam, Anxiolytic Activity

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Introduction

Anxiety is an uncomfortable state of internal turmoil that is frequently accompanied by tense behaviour, somatic complaints, and ruminating. When anxiety is extreme, it may be deemed an anxiety disorder and can significantly reduce quality of life by causing many psychosomatic disorders. Agoraphobia, Specific Phobia, Social Anxiety Disorder (Social Phobia), Panic Attack, Separation Anxiety Disorder, and Selective Mutism are included in this class of disorders. It is defined as "a state of intense apprehension, uncertainty, and fear resulting from the anticipation of a threatening event or situation," frequently to the point where it interferes with normal physical and psychological functioning. About two-thirds of anxious patients respond to the treatments that are currently available, but the extent of the improvement is still disappointing. In addition, these patients also produce a variety of systemic side effects and show dependence and tolerance to long-term medication, which has now raised serious questions about the use of the medications that are currently available in the market. [1-3]

Sarcostemma acidum commonly known as somlata belongs to the family Asclepiadacea grown in India, Europe and US is an underutilized crop. The herb is highly uses by the rural and tribal people in curing various disorders such as asthma, swelling, fever and cold, dyspepsia, inflammatory infection, gastric problems and as rejuvenating .There is a great need to conserve these medicinal plants because they contain highly bioactive components which can be developed into pharmacologically active agents. The plant is widely used in the treatment of various disease and disorders, so there is need necessary conservation of this plant. The selected plant were also used for the treatment of anxiety however, only limited literature are available.[4-6]Therefore the present work was undertaken

Material and Methods

Collection and authentication of Plant Material

The roots of *Sarcostemma acidum* W. & A. was collected in the months of July-August 2017 from Malwa region and was authenticated by the Botanist.

Extraction of Plant Material

The shade dried coarsely powdered plant material (250gms) were loaded in Soxhlet apparatus and was extracted with ethanol and water (90:10) until the extraction was completed. Further After completion of extraction, the solvent was removed by distillation. The extracts were dried using rotator evaporator. [7-8]

Acute toxicity study of extract (LD₅₀)

Acute oral toxicity studies have been conducted separately followed by using OECD guideline 423. The method used defined doses of 5, 50, 300, 2000 mg/kg *p.o.* body weight. Results were allowed substance rank and classify according to the Globally Harmonized System (GHS) for classification of chemicals which causes acute toxicity. From LD₅₀ determination, 1/10th of the dose was focused as the medial for pharmacological screening. Since all the animals were alive; no mortality, no toxicity and no significant changes in the body weight between the control and treated group were observed at a dose of 2000 mg for duration of 72 hours. All experimental protocols were reviewed and accepted by the Institutional Animal Ethical Committee (IAEC) prior to the initiation of the experiment. [9]

Anxiolytic Activity (By Elevated plus maze apparatus)

An elevated plus maze consisting of two open arms (35×6 cm) and two enclosed arms (35 × 6 × 15 cm) has been used. The maze has been elevated to the height of 40 cm. Mice has been placed individually in center of apparatus, facing towards enclosed arm. The time spent by the mouse during the next 05 minutes in open & enclosed arm has been recorded on second and seventh day of dosing schedule. The animals received vehicle (1ml/kg) or plant extracts 60 minutes before and diazepam (1mg/kg, *i.p.*), 30 min. before placement on the apparatus. The increased exploratory activity in the open arm has been taken as an indicator of anxiolytic activity. [10]

Statistical Analysis

Results are expressed as means ± standard error of the mean (SEM). Comparisons between the averages of series of values were performed by ANOVA followed by Dunnett's multiple comparisons test. Data analysis employed Graphpad INSTAT version 2.0 software; statistical significance was set at P<0.05.

Results and Discussion

The present study was done with an objective to explore the anxiolytic activity of hydro-alcoholic extract of aerial part of *S. acidum* in mice and the results are summarized in table 1. The results obtained indicate that the extract found to have significant (P < 0.05) anxiolytic activity. The aqueous extract at the test doses 400 mg/kg b.w. showed maximum activity when compared with standard drug.

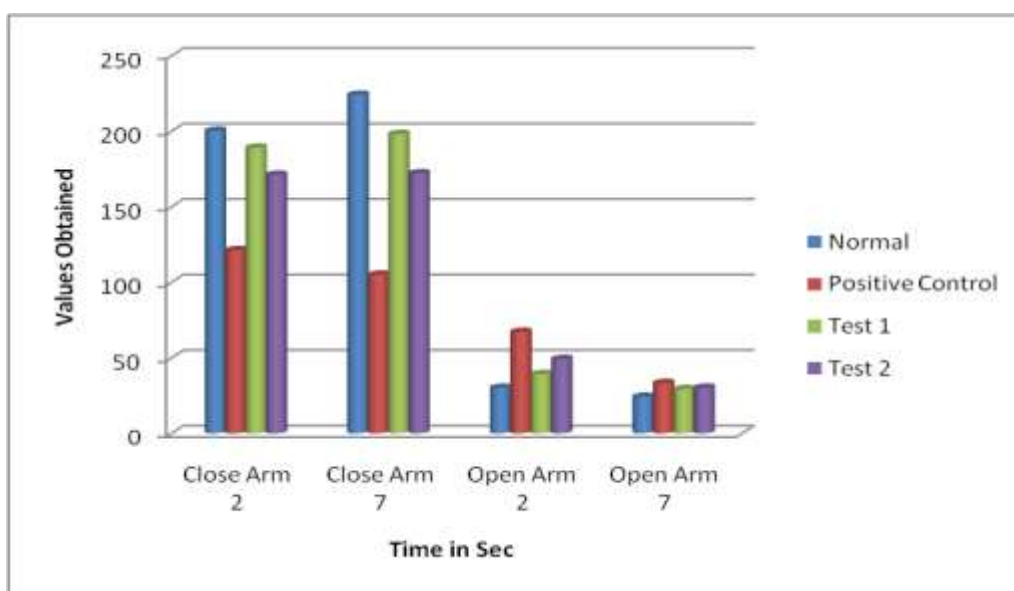
Conclusion

The present investigation showed that *S. acidum* aerial parthydri-alcoholic extract had marked effects on the anxiety-related behavioural parameters on exposure to the light/dark test in mice. The extract causes“anxiolytic” behaviour comparable with the effects of diazepam.

Table 1: Anxiolytic activity of *S. acidum* hydroalcoholic root extract

Group	Treatment (mg/kg) , <i>p.o.</i>	Time Spent in Closed Arm (Sec.) (2 nd Day)	Time Spent in Closed Arm (Sec.) (7 th Day)	Time Spent in Open Arm (Sec.) (2 nd Day)	Time Spent in Open Arm (Sec.) (7 th Day)
Normal Control	Saline	201.11 ± 0.21	223.10	30.21± 0.09	24.20
Positive control	Diazepam (1 mg/kg) <i>i.p.</i>	120.09 ± 0.21	104.21	68.20 ± 0.12	34.28
Test 1 200 mg/kg	HASAR	188.29 ± 0.08	197.26	40.07 ± 0.02	28.32
Test 2 400 mg/kg	HAESAR	173.02 ± 0.92	173.06	48.29 ± 0.04	31.86

* P<0.05, compared to control (ANOVA followed by Dunnett's multiple comparisons test).

**Graph 1: Anxiolytic activity of *S. acidum* hydroalcoholic root extract**

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