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Anti-anxiety activity of *Gloriosa superba* Linn.

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Abstract

Plan: Anti-anxiety activity of *Gloriosa superba* Linn.

Prologue: *Gloriosa superba* Linn. (Family: Liliaceae) is widely used as a medicinal plant. *Gloriosa superba* Linn. has several therapeutic applications including anti-inflammatory, anthelmintic, abotifacient, oxytocic, analgesic antimicrobial and mutagenic activities¹⁻³. The petroleum ether and ethanol extracts of powdered aerial part of *Gloriosa superba* Linn. were studied for anti-anxiety activity.

Methodology: Anti-anxiety activity of *G. superba* Linn. were studied by using Elevated Plus Maze (EPM) model in albino mice.

Outcome: Albino mice were treated orally with dose 300 mg/kg of the extracts and behavior was observed on the EPM. Diazepam (2mg/kg, P.O) was used as a positive control. The results indicated that alcoholic extract exhibited significant result as compared to the standard drug.

Keywords: *Gloriosa superba* Linn., Elevated plus Maze, anti-anxiety activity

1. Introduction

Gloriosa superba Linn. also known as Glory lily belongs to the family Liliaceae. *Gloriosa superba* Linn is one of the endangered species among the medicinal plants. It is one of the seven upavishas in the Indian medicine, which cure many ailments but may prove fatal on misuse. It is found growing throughout tropical India, from the North -West Himalayas to Assam and the Deccan peninsula, extending up to an elevation of 2120 M. In Karnataka, it is commonly found growing all along the Western Ghats; it is also found growing in Madagascar, Srilanka, Indo-China and on the adjacent island⁴.

The tuberous root stocks of *G. superba* boiled with Sesamum oil is applied twice a day on the joints, affected with arthritis reduces pain. It is also used to treat intestinal worms, bruises, infertility, skin problem and impotence. *Gloriosa superba* Linn. has several therapeutic applications including anti-inflammatory, anthelmintic, abotifacient, oxytocic, analgesic antimicrobial and mutagenic activities⁵⁻⁹.



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2. Experimental

2.1 Preparation of extracts, and their phytochemical screening:

The shade dried plant material was powdered using mixture grinder and subjected to soxhlet extraction with petroleum ether (60-80°C), chloroform and ethanol and water in order of increasing polarity of solvents. The condensed extracts were used for preliminary screening of phytochemicals such as alkaloids, steroids, carbohydrates, fixed oils, fats, tannins, phenolic compounds, proteins, amino acids, saponin, gums, mucilage, glycosides, terpenoids and flavonoids. Results obtained are presented in Table-1.

2.2 Animals:

The experimental animals [Swiss *albino* mice (20-25 gm) of either sex] were procured from animal house Swami Vivekanandha College, Tamilnadu. The animals were given standard laboratory feed and water *ad libitum*. The animals were fasted for 18 h before use. The approval from the Institutional Animal Ethical Committee IAEC No. 889/PO/ac/05/CPCSEA) of Swamy Vivekanandha College, Tamilnadu, was taken before carrying out biological studies.

2.3 Evaluation of Anti-anxiety Activity

2.3.1 Preparation of doses:

Animals were divided into four groups Group I was a negative control and was given vehicle, consisting of acacia (2%), in a dose of 1 ml/100gm. Group II was a positive control and was given standard drug, diazepam (2mg/kg, orally), suspended in the vehicle. Group III-IV were treated as test groups and were given petroleum ether and ethanol extracts of *Gloriosa superba* Linn. at dose of 300 mg/kg respectively. All the test solutions, standard drug and control were administered orally 45 min prior to elevated plus maze study.

2.3 Solvents:

2.4 Elevated plus maze model of anxiety:

The anti-anxiety activity was evaluated by using elevated plus maze (EPM) model in albino mice. The elevated plus-maze model is a well established animal model for testing anxiolytic drugs. The elevated plus-maze apparatus consist of two open arms (16 x 5 cm for mice and 50 x 10 cm for rats), two closed arms (16 x 5 x 12 cm for mice and 50 x 10 x 40 cm for rats), and an open roof with the entire maze elevated (25 cm for mice and 50 cm for rats) from the floor. The animals were placed individually in the centre of the maze, head facing towards open arms and the stop watch was started and following parameters were noted for 5 min. a) First preference of mice to open and closed arm. b) Number of entries in open and closed arms (an arm entry defined as the entry of four paws into the arm) c) Average time each animal spends in each arm (average time = total duration in the arm/number of entries)¹⁰⁻¹¹.

2.5 Vehicle and standard

Distilled water + acacia (2%), were used as vehicle for preparing the suspension of test doses of different extracts. Diazepam (2 mg/kg) was used as standard drug.

2.6 Statistics:

The results have been expressed as mean \pm standard error of mean (S.E.M). The test dose were compared with diazepam and controlled by Dunnet's test using Graph Pad Software.

3. Results and discussion:

Table-1 and Table-2 showed the results of phytochemical screening of various extracts of *Gloriosa superba* Linn. and their anti-anxiety activity respectively. Phytochemical screening of ethanolic and aqueous extracts showed presence of carbohydrates, alkaloids and saponins. Amongst various extracts ethanolic extract of *Gloriosa superba* Linn. significantly increased mean number of entries and meantime spent by mice in open arms of elevated plus maze apparatus at the dose of 300 mg/kg with respect to control, thereby producing anti-anxiety activity.

Table 1: Results of phytochemical screening of *Gloriosa superba* Linn.

S.No.	Test	Petroleum ether extract	Chloroform extract	Ethanol extract	Aqueous extract
1	Carbohydrates				
	a) Molisch test	-	-	+	+
	b) Fehling's test	-	-	+	+
	c) Benedict's test	-	-	+	+
2.	Alkaloids				
	a) Dragondroff's test	-	-	+	+
	b) Mayer's test	-	-	+	+
	c) Wagner's test	-	-	+	+
	d) Hager's test	-	-	+	+
3.	Saponins	+	+	+	+
4.	Fixed oils and fats	+	+	-	+
5.	Flavonoids	+	-	-	+
6.	Proteins	-	-	-	+
7.	Gum and mucilage	+	+	+	-
8.	Phenolic compounds and tannins	-	-	-	-
9.	Terpenoids	+	+	+	-
10.	Glycosides	-	-	-	-

Table 2: Anti-anxiety activity of *Gloriosa superba* Linn.

Sr. No.	Groups	Mean no. of entries in open arm(5 minutes)
1	Control (2% acacia 1mg/100gm)	108.33± 6.83
2	Standard drug (Diazepam 2 mg/kg)	215.33 ± 15.63*
3	Ethanollic extract (300mg/kg)	112.33± 40.33
4	Petroleum ether extract (300mg/kg)	101±34.66

Values are expressed as mean ± S.E.M; *P<0.05-significant, **P<0.01-very significant; Degree of freedom-5,30;F=6.395

4. Conclusion

Finally, it was concluded from the present study that ethanolic extract of *Gloriosa superba* Linn. exhibited good anti-anxiety activity at the dose of 300 mg/kg in mice using elevated plus maze model of anxiety.

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