Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 10 [12]November 2021 : 121-123

Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD

ORIGINAL ARTICLE **OPEN ACCESS**

Investigation of Acute Toxicity Studies of various Extracts of B*arleria prionitis* Linn.

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ABSTRACT
Barleria prionitis Linn., Vajradanti (Hindi), family Acanthaceae is native of Southern Asia, India and China. The plant or its specific parts (root, stem, leaf, bark, flower and seed) is used in the treatment of toothache, catarrhal affections, whooping cough, inflammations, glandular swellings, urinary infection, jaundice, fever, gastrointestinal disorders and as diuretic and tonic. The plant is popular in Indian traditional medicine and as such provides good to develop herbal drug preparation to be used as phytomedicine. The present work aims to investigate the acute toxicity profile of selected medicinal plant. In the present study petroleum ether, chloroform, ethanolic and aqueous extract of Barleria prionitis Linn (Roots, Stem, Leaves & Flowers) were evaluated for acute toxicity studies using OECD guidelines 423. The results indicate that all the extract at the dose of 2000 mg/kg b.w. are considered as safe.
***Keywords**: Barleria prionitis Linn, Acute Toxicity Studies, Extract*

Received 18.06.2021 Revised 21.09.2021 Accepted 13.11.2021

INTRODUCTION

In Ayurvedic system of medicine herbal drugs are usually consider as less toxic or have no any toxic/adverse effects.[1-2]. But for the better use of herbal drugs it is essential to screened scientifically.
Barleria prionitis is a perennial plant and is a shrub with yellow flowers and two flat seeds shielded with matted hairs, inhabit most parts of India. Various parts of the plant such as leaves, roots, aerial parts, flowers, and stems are used in the traditional system of medicine. Conventionally, various infusions are prepared using the plant parts and utilized for the treatment of different kinds of diseases. Owing to its incredible odontalgic property, it is extensively used in treating bleeding gums and toothache. From the pharmacological point, the plant has been effectively screened for antibacterial, antifungal, antiviral, anti-inflammatory, antifertility, antioxidant, enzyme inhibitory, hepatoprotective, antihypertensive, anticancer, and anticataract activities. Compounds such as tannins, saponins, glycosides, phenolic acids, phytosterols, and terpenes have been identified in the plant. The plant contains some specific compounds such as barlenoside, barlerine, acetylbarlerine, and balarenone and some common secondary metabolites such as lupeol, Î²-sitosterol, vanillic acid, and syringic acid[3-6]. Keeping these facts in consideration the present work was undertaken to determine the acute toxicity of the plant, therefore, the present work was undertaken to revel the effective dose.

MATERIAL AND METHODS

Collection of herbs and their authentication

The root, stem, leaves and flowers of *Barleria prionitis* Linn. were collected in the months of July-September 2020 from the various local sites of Malwa region of Madhya Pradesh and identified & authenticated by Dr. S. N. Dwivedi, Retd. Prof. and Head, Department of Botany, Janata PG College, A.P.S. University, Rewa, (M.P.) and was deposited in our Laboratory. Voucher specimen No. J/Bot/2020-BPRSLF-014, 015, 016 & 017 was allotted.

Successive Extraction of selected herbs

Sample were shattered and screened with 40 mesh. The shade dried coarsely powdered plant material (250gms) were loaded in Soxhlet apparatus and was extracted with petroleum ether (60-62°C), Chloroform, ethanol and water until the extraction was completed. After completion of extraction, the

solvent was removed by distillation. The extra cts were dried using rotator evaporator. The residue was then stored in dessicator and percentage yield were determined [7].

Acute Toxicity Studies of Extracts

Organization for Economic co-operation and Development (OECD) regulates guideline for oral acute toxicity study. It is an international organization which works with the aim of reducing both the number of animals and the level of pain associated with acute toxicity testing [8].

Following are the main type of guideline followed by OECD

- Guideline 420, Fixed dose procedure. (5 animals used)
- Guideline 423, Acute toxic class. (3 animals used)
- Guideline 425, Up and down method. (1 animal used)

Procurement of experimental animals

The mice were used for acute toxicity study as per OECD guidelines 423. The animals were fed with standard pellet diet (Hindustan lever Ltd. Bangalore) and water ad libitum. All the animals were housed in polypropylene cages. The animals were kept under alternate cycle of 12 hours of darkness and light. The animals were acclimatized to the laboratory condition for 1 week before starting the experiment. The experimental protocols were approved by Institutional Animal Ethics Committee, after scrutinization.

RESULTS AND DISCUSSION

The petroleum ether, chloroform, ethanolic and aqueous extract of roots, stem, leaves and flowers of *Barleria prionitis* Linn. were screened for acute toxicity studies as per OECD guidelines 423 for the determination of LD50 and ED50. The results (Table 1-4) indicates that all extract showed no any toxicity at the dose of 2000 mg/kg body weight, hence the LD50 for the selected drugs was 2000 mg and ED50 was $1/10^{th}$ of LD 50 i.e., 200 mg. As per OECD423 guidelines the dose is said to be "unclassified" under the toxicity scale. Hence further study with higher doses was not executed.

The acute toxicity study showed that petroleum ether, chloroform, ethanolic and aqueous extract of BPR, BPS, BPL and BPF produced no toxic effects as evidenced by the absence of signs of toxicity (or) mortality in the animals during the study period (14 days of observation). Additionally, no weight losses, alternation of consumption of pellet or macroscopic alterations in the viscera of treated animals were detected. (table 5).

Table 1: Determination of LD_{50} and ED_{50} of Extract of *Barleria prionitis* Linn. (Roots)

S/No.	No. of Animals	Extract Dose (mg/kg)	No. of death of animals			
			PEEBPR	CEBPR	EEBPR	AEBPR
1.	3	5	0	0	0	0
2.	3	50	0	0	0	0
3.	3	300	0	0	0	0
4.	3	2000	0	0	0	0
5.	3	5000	0	0	0	0

Table 2: Determination of LD_{50} and ED_{50} of Extract of *Barleria prionitis* Linn. (Stem)

S/No.	No. of Animals	Extract Dose (mg/kg)	No. of death of animals			
			PEEBPS	CEBPS	EEBPS	AEBPS
1.	3	5	0	0	0	0
2.	3	50	0	0	0	0
3.	3	300	0	0	0	0
4.	3	2000	0	0	0	0
5.	3	5000	0	0	0	0

Table 3: Determination of LD_{50} and ED_{50} of Extract of *Barleria prionitis* Linn. (Leaves)

S/No.	No. of Animals	Extract Dose (mg/kg)	No. of death of animals			
			PEEBPL	CEBPL	EEBPL	AEBPL
1.	3	5	0	0	0	0
2.	3	50	0	0	0	0
3.	3	300	0	0	0	0
4.	3	2000	0	0	0	0
5.	3	5000	0	0	0	0

Table 4: Determination of LD_{50} and ED_{50} of Extract of *Barleria prionitis* Linn. (Flowers)

S/No.	No. of Animals	Extract Dose (mg/kg)	No. of death of animals			
			PEEBPF	CEBPF	EEBPF	AEBPF
1.	3	5	0	0	0	0
2.	3	50	0	0	0	0
3.	3	300	0	0	0	0
4.	3	2000	0	0	0	0
5.	3	5000	0	0	0	0

Table 5: Acute toxicity study of various extracts of *Barleria prionitis* Linn. (Root, Stem, Leaves and Flowers)

Parameters	Duration of observations							
	1 hr	2 hr	3 hr	4 hr	8 hr	24 hr	8th Day	14th Day
Appearance	N	N	N	N	N	N	N	N
Activity	P	P	P	P	P	P	P	P
Touch	++	++	++	++	++	++	++	++
Sound	++	++	++	++	++	++	++	++
Light	++	++	++	++	++	++	++	++
Lacrimation	A	A	A	A	A	A	A	A
Salivation	A	A	A	A	A	A	A	A
Licking of paw	A	A	A	A	A	A	A	A

Abbr.: N = Normal, A = Absent, P = Present, + = minimum, ++ = present medium

CONCLUSION

The results clearly indicate that various parts of *Barleria prionitis* Linn. i.e., Root, Stem, Leaves & Flowers extracts does not possess any toxicity and are therefore considered as safe at the dose of 2000 mg/kg body weight. Therefore, the plants may be used for the formulation at the dose of 2000 mg/kg body weight.

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CITATION OF THIS ARTICLE

Salaj Khare and Sumeet Dwivedi. Investigation of Acute Toxicity Studies of various Extracts of B*arleria prionitis* Linn. Bull. Env. Pharmacol. Life Sci., Vol 10[12] November 2021 : 121-123.