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Comparative Anti-inflammatory Activity of various parts of *Barleria prionitis* Linn.

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Abstract

Barleria prionitis Linn. commonly known as Vajradanti in Hindi and Porcupine in English belongs to 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 present work aims to investigate the anti-inflammatory activity of various parts of *B. prionitis* Linn. using Carrageenan induced paw oedema. The results indicate that stem and leaves extract at the dose of 250 and 500 mg/kg b.w. showed significant activities as compared to root and flower extract.

Keywords: Anti-inflammatory Activity, Barleria prionitis Linn., Extracts

Introduction

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.[1-2] Conventionally, various infusions are prepared using the plant parts and utilized for the treatment of different kinds of diseases. 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. [3-4] 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. [5-7]

So, far no any systematic study was carried out to determine the comparative anti-inflammatory activity of various parts of the plants.

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.

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Anti-inflammatory Activity[8]
(Carrageenan induced paw oedema)
Animals
Adult albino rats of both sex (200-250 gm) were procured, maintained under ideal feeding and management practices in the laboratory.
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.
Study Design
The animals were divided into different groups (Control, treated with different extract & Standard) each containing six animals. Group I served as untreated control and received 0.9 normal saline, group II served as positive control and received Indomethacin (10 mg/kg, i.p.) and others group were treated with different doses of Pet. Ether, Chloroform, ethanolic and aqueous extract of root, stem, leaves and flower of *Barleria prionitis* Linn.
Anti-inflammatory Screening
The Pet. Ether, Chloroform, ethanolic and aqueous extract of root, stem, leaves and flower of *Barleria prionitis* Linn.and standard drug Indomethacin were administered in prescribed doses. Control received 0.1 ml of 1% carrageenan in normal saline. The administration of extract and drug was 30 min prior to injection of 0.1 ml of 1% carrageenan in the right hind paw sub platar of each rat. The paw volume was measured plesthysmometrically (model 7140, Ugo Basil, Italy). Prior to injection of carrageenan, the average volume of the right hind paw of each rat was calculated. At 1, 3 and 5hr after injection paw volume was measured. Reduction in the paw volume compared to the vehicle-treated control animals was considered as anti-inflammatory response.
Statistical analysis
All the values ware statistically analyzed by one-way analysis of variance (ANOVA) followed by Dunnett's test. Comparison between control and drug treated groups were considered to be significant (*P<0.01). All values are expressed as mean ± SEM.

Results and Discussion
The PEE, CE, EE and AE of root, stem, leaves and flower of *Barleria prionitis* Linn. were screened for anti-inflammatory activity in animal models and the results are summarized in Table 1. The result obtained indicates that the stem and leaves extract found to have significant anti-inflammatory activity than root and flower extract at the test doses 250 and 500 mg/kg b.w. when compared to standard drug and control group. The aqueous extract was found more significant than ethanolic extract followed by chloroform extract and pet. Ether extract.

Conclusion
From the results obtained it was concluded that *Barleria prionitis* Linn. exhibit anti-inflammatory activity. The anti-inflammatory activity of stem and leaves was found to be more significant than root and flower at the dose of 250 and 500 mg/kg bw.

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Table 1: Comparative Anti-inflammatory activity of various parts of *Barleria prionitis* Linn. extracts on carrageenan induced oedema

Treatment	Dose (mg/kg)	Right hind paw volume (mL)		
		1 h	3h	5h
C	-	1.89±0.23**	1.85±0.12**	1.75±0.11*
SD	10	1.20±0.32*	0.73±0.41*	0.68±0.83**
PEEBPR	250	1.84±0.03*	1.83±0.21*	1.74±0.33*
	500	1.82±0.11*	1.80±0.02**	1.72±0.21*
CEBPR	250	1.82±0.11**	1.78±0.16*	1.71±0.20*
	500	1.80±0.11*	1.79±0.32**	1.68±0.02*
EEBPR	250	1.80±0.04*	1.77±0.12*	1.71±0.02**
	500	1.78±0.12*	1.67±0.10*	1.58±0.4*
AEBPR	250	1.71±0.03*	1.65±0.22*	1.55±0.67*
	500	1.68±0.01**	1.59±0.02**	1.49±0.01**
PEEBPS	250	1.66±0.11**	1.55±0.12*	1.47±0.52*
	500	1.66±0.22**	1.50±0.32**	1.39±0.65*
CEBPS	250	1.56±0.32*	1.47±0.32*	1.32±0.43**
	500	1.55±0.03**	1.34±0.12*	1.23±0.65*
EEBPS	250	1.48±0.23*	1.21±0.76**	1.19±0.32*
	500	1.46±0.33**	1.18±0.03*	0.98±0.34*
AEBPS	250	1.34±0.28*	0.99±0.81*	0.92±0.02**
	500	1.32±0.06**	1.85±0.20*	0.88±0.31**
PEEBPL	250	1.80±0.50*	1.78±0.32**	1.75±0.22*
	500	1.78±0.32**	1.76±0.02*	1.71±0.01**
CEBPL	250	1.69±0.12*	1.56±0.02*	1.49±0.93*
	500	1.68±0.31**	1.45±0.10**	1.39±0.02*
EEBPL	250	1.58±0.13*	1.24±0.11*	1.22±0.01**
	500	1.47±0.18*	1.22±0.16**	0.98±0.31**
AEBPL	250	1.39±0.12*	1.11±0.33**	0.88±0.09*
	500	1.35±0.16**	0.97±0.03**	0.86±0.09*
PEEBPF	250	1.89±0.11*	1.88±0.22*	1.79±0.03*
	500	1.88±0.21*	1.78±0.30*	1.75±0.23*
CEBPF	250	1.87±0.32**	1.77±0.43*	1.77±0.03*
	500	1.86±0.90**	1.76±0.21*	1.75±0.13*
EEBPF	250	1.84±0.12*	1.76±0.81*	1.74±0.12**
	500	1.82±0.12*	1.74±0.52*	1.69±0.44*
AEBPF	250	1.80±0.36*	1.71±0.32*	1.64±0.30*
	500	1.79±0.30*	1.70±0.22*	1.38±0.21*

Values are expressed as X (Mean) ±SEM, n=6. (One way ANOVA followed by Dunnett Multiple Comparison Test). Statistically significance *P<0.01, **P<0.001in comparison to control. **Abbr.**: C=Control, SD=Standard drug (Indomethacine)

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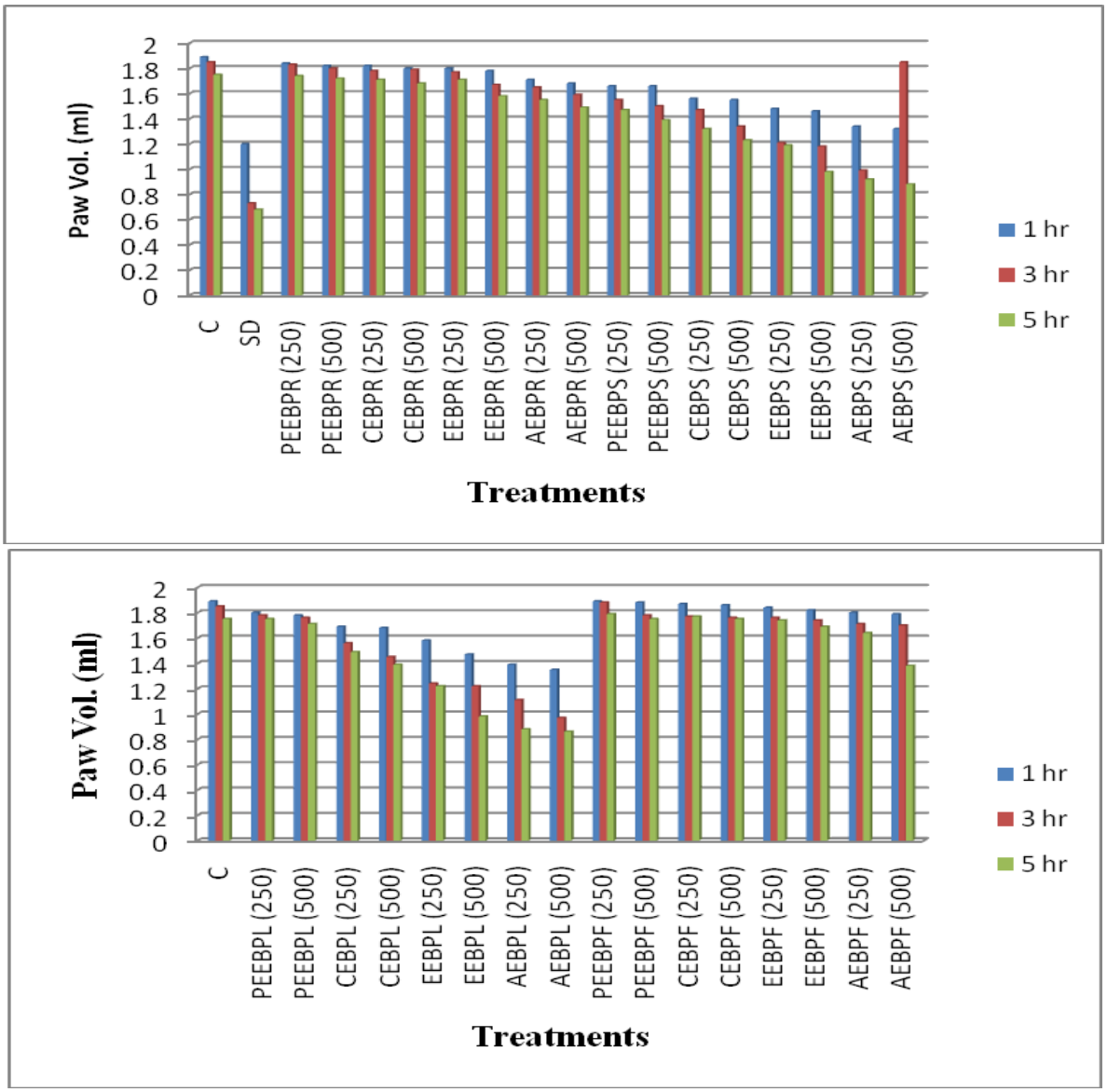

Graph 1: Comparative Anti-inflammatory activity of *Barleria prionitis* Linn.

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