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Anti-inflammatory Activity of Leaves Extracts of *Cupressus torulosa* D. Don ex Lamb. and *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li

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Abstract

The present work aims to investigate the anti-inflammatory activity of selected medicinal plants. In the present study petroleum ether, chloroform, ethanolic and aqueous extract of *Cupressus torulosa* D. Don ex Lamb. (Leaves) and *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li (Leaves) were evaluated for anti-inflammatory activity using Carrageenan induced paw oedema. The results indicate that ethanolic and aqueous extract at the dose of 250 and 500 mg/kg b.w. showed significant activities as compared to pet. Ether and chloroform extract.

Keywords: Anti-inflammatory Activity, Cupressus sp., Leaves

Introduction

India medicinal plants is considered as less toxic or don't have any toxicity[1-2].The better use of these herbal drugs and there scientific validation need to be established. The present study was designed to evaluate anti-inflammatory activity of two medicinal plants.

Cupressus torulosa D. Don ex Lamb. (Himalayan cypress or Bhutan cypress), is native to the mountainous northern regions of the Indian Subcontinent, primarily the Himalayas. It is a large tree, growing up to 45 m (150 ft) in height.[3-4]

Cupressus vietnamensis (Farjon & Hiep) Q.P. Xiang & J. Li. (Vietnamese golden cypress), is native to the Vietnam, also found in Himalaya regions. The tree is 10-15 m tall in height. [5-8]

So, far no any systematic study was carried out to determine the anti-inflammatory activity of these plants, therefore, the present work was undertaken to ascertain its folk and traditional use.

Material and Methods

Collection of herbs and their authentication

The leaves of *Cupressus torulosa* D. Don ex Lamb. (CTL) and *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li. (CVL) were collected in the months of July-December 2020 from the Himalaya region 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-CTL012 & CVL013 was allotted.

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Anti-inflammatory Activity[9]
(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 leaves of *Cupressus torulosa* D. Don ex Lamb. (CTL) and *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li. (CVL).
Anti-inflammatory Screening
The Pet. Ether, Chloroform, ethanolic and aqueous extract of leaves of *Cupressus torulosa* D. Don ex Lamb. (CTL) and *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li. (CVL) 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 *Cupressus torulosa* D. Don ex Lamb. (Leaves) and *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li (Leaves) were screened for anti-inflammatory activity in animal models and the results are summarized in Table 1 & 2. The result obtained indicates that the extract found to have significant anti-inflammatory activity. The PEE, CE, EE and AE of CVL at the test doses 250 and 500 mg/kg b.w. produced profound anti-inflammatory activity and is more potent, when compared with the PEE, CE, EE and AE of CTL at the test doses 250 and 500 mg/kg b.w. when compared to standard drug and control group.

Conclusion
From the results obtained it was concluded that the selected plants i.e., *Cupressus torulosa* D. Don ex Lamb. (Leaves) and *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li (Leaves) exhibit anti-inflammatory activity. The anti-inflammatory activity of *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li (Leaves) was found to be more significant than *Cupressus torulosa* D. Don ex Lamb. (Leaves) at the dose of 250 and 500 mg/kg bw.

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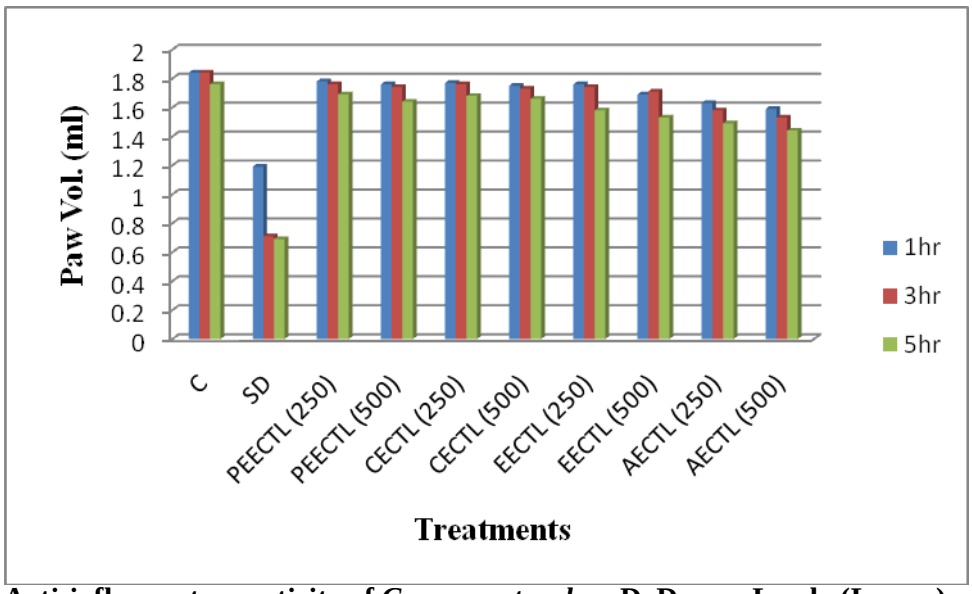
Table 1: Anti-inflammatory activity of *Cupressus torulosa* D. Don ex Lamb. (Leaves) extracts on carrageenan induced oedema

Treatment	Dose (mg/kg)	Right hind paw volume (mL)		
		1 h	3h	5h
C	-	1.84±0.11**	1.84±0.13**	1.76±0.06*
SD	10	1.19±0.18*	0.71±0.32*	0.69±0.71**
PEECTL	250	1.78±0.33*	1.76±0.29*	1.69±0.21*
	500	1.76±0.12*	1.74±0.62**	1.64±0.33*
CECTL	250	1.77±0.31**	1.76±0.12*	1.68±0.21*
	500	1.75±0.71*	1.73±0.45**	1.66±0.32*
EECTL	250	1.76±0.84*	1.74±0.42*	1.58±0.62**
	500	1.69±0.82*	1.71±0.12*	1.53±0.80*
AECTL	250	1.63±0.23*	1.58±0.23*	1.49±0.32*
	500	1.59±0.62**	1.53±0.42*	1.44±0.23*

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)



Graph 1: Anti-inflammatory activity of *Cupressus torulosa* D. Don ex Lamb. (Leaves) extracts on carrageenan induced oedema

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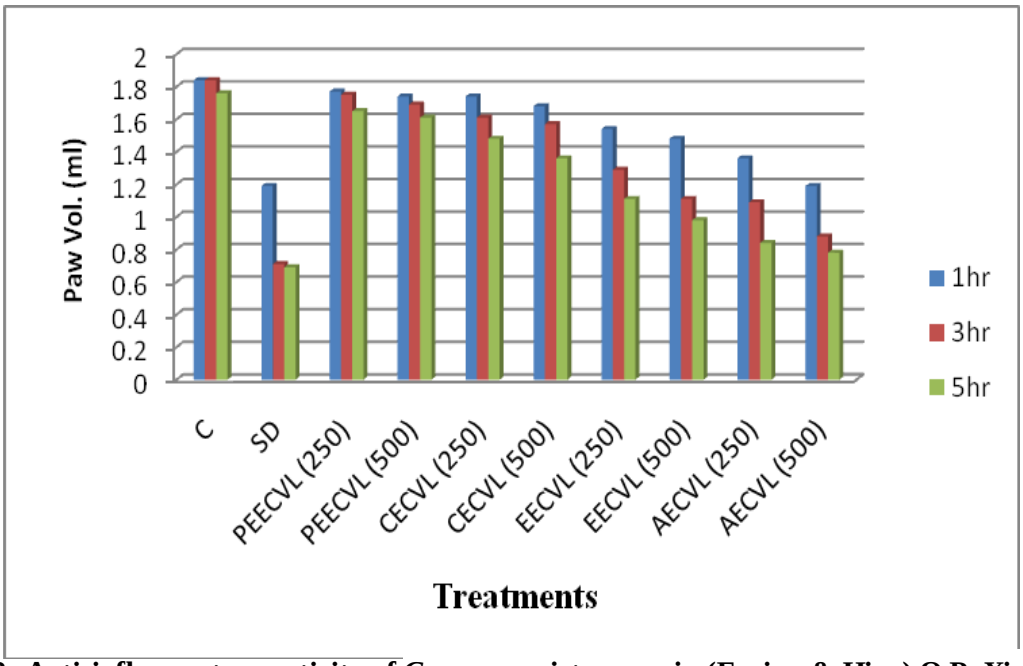
Table 2: Anti-inflammatory activity of *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li (Leaves) extracts on carrageenan induced oedema

Treatment	Dose (mg/kg)	Right hind paw volume (mL)		
		1 h	3h	5h
C	-	1.84±0.11**	1.84±0.13**	1.76±0.06*
SD	10	1.19±0.18*	0.71±0.32*	0.69±0.71**
PEECVL	250	1.77±0.31*	1.75±0.19*	1.65±0.29*
	500	1.74±0.11*	1.69±0.23**	1.61±0.03*
CECVL	250	1.74±0.11**	1.61±0.12*	1.48±0.01*
	500	1.68±0.21*	1.57±0.01**	1.36±0.12*
EECVL	250	1.54±0.04*	1.29±0.42*	1.11±0.12**
	500	1.48±0.12*	1.11±0.51*	0.98±0.10*
AECVL	250	1.36±0.06*	1.09±0.04*	0.84±0.22*
	500	1.19±0.12**	0.88±0.22*	0.78±0.22*

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



Graph 2: Anti-inflammatory activity of *Cupressus vietnamensis* (Farjon & Hiep) Q.P. Xiang & J. Li (Leaves) extracts on carrageenan induced oedema

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