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Anti-Inflammatory Activity of Celastrus Paniculatus Seeds

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Abstract

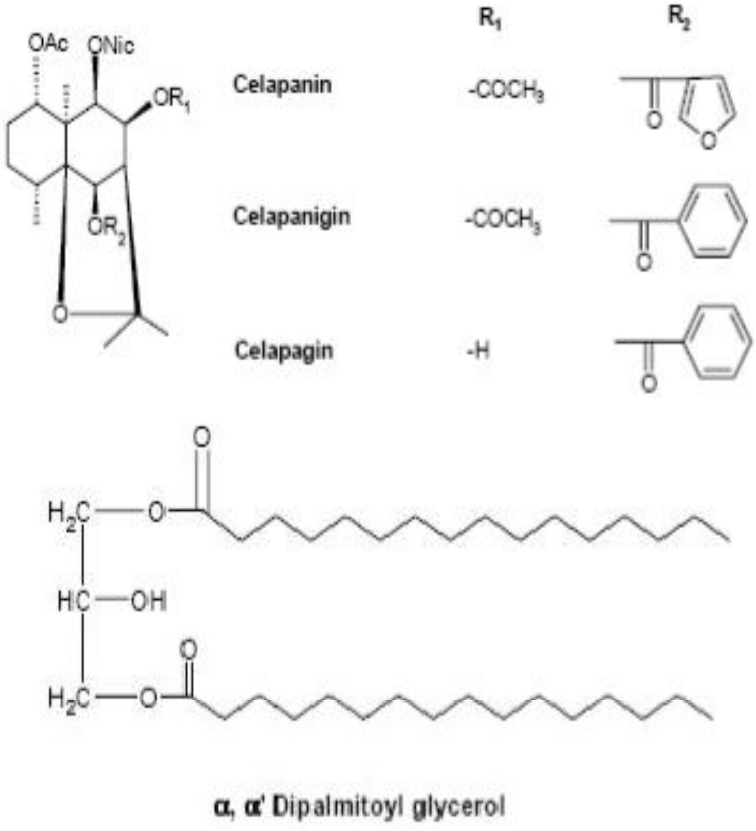
Celastrus paniculatus is a large climbing unarmed shrub with long slender elongating branches which are reddish brown and covered with white venticels.Seed oil has bitter taste and useful in abdominal disorder, beri-beri and sores. But so far no report is available regarding anti-inflammatory activity of the seeds. Celastrine and paniculatine are the two alkaloids present in the seeds. The seeds were shade dried, powdered and subjected to extraction with alcohol and methanol using Soxhlet apparatus. Therefore the following study was performed to evaluate scientifically the anti-inflammatory activity by carrageenan induced hind paw odema method on the albino rats and compared with diclofenac sodium as reference and it shows signifigant anti-inflammatory activity.

Key works: Anti- Inflammatory, Celastrus paniculatus

Introduction:

Inflammation is a tissue reaction to infection irritation or a foreign substance. Its a part of host defense mechanism and the inflammatory response is a polyphasic tissue reaction 2(37). Clinically the anti-inflammatory drugs are judged by their effect on the pain, stiffness or swelling of the affected part, the action on swelling being the most widely observable and therefore the most important. Celastrus paniculatus 1-4is a large climbing unarmed shrub with long slender elongating branches which are reddish brown and covered with white venticels .Leaves are simple alternate, ovate or obovate, crenulte, coriaceous, glabrous, lateral nerves aching.Flowers are greenish white in terminal dropping panicles. Fruit Capsules depressed globose, 3- lobed, bright

yellow when ripe, opening to expose the brown seeds coloured with orange red aril. The leaves contains alkaloids, a glucoside and colouring matter,whereas the oil extracted from seeds contain sterols, alkaloids and a bright colouring matter, Celapanin, Celapanigin ,Celapagin ,Celastrine and paniculatine are the some important alkaloids present in the seeds. The oil also contains sesquiterpene like dipalmitoyl glycerol, alkaloids viz. The yield of alkaloids is 0.0015% and 0.0010% respectively. Bark has been reported to be useful as abortifacient, depurative and brain tonic. Leaves are emmenagogue and the leaf sap is a good antidote for opium poisoning. Seeds have acrid and bitter taste. They have emollient, stimulant, laxative, emetic and expectorant property. They have also been used as an anti-inflammatory, anti-asthmatic and antileprotic. Seed oil has bitter taste and useful in abdominal disorder, beri-beri and sores. But so far no report is available regarding anti-inflammatory activity of the seeds. Therefore the following study was performed to evaluate scientifically the anti-inflammatory activity by carrageenan induced hind paw odema method on the albino rats and compared with diclofenac sodium (ref).



α, α' Dipalmitoyl glycerol

Materials and methods

Shade dried and powdered seeds of Celastrus paniculatus, Ethanol, Methanol, Soxhlet apparatus. Carrageenan, Diclofenac sodium, Plethysmograph were used

as received.Collection of plant material.The seeds were procured from INDIAN HERBS HOSUR, BANGALORE and identified by the botanist.

Extract preparation:

The seeds were shade dried, powdered and subjected to extraction with alcohol and methanol using Soxhlet apparatus. The solvent was removed after the completion of extraction.

Experimental:

Toxicity Studies:

The ethanolic and methanolic extracts of Celastrus paniculatus seeds were subjected to toxicity studies according Reed and Muench method.The oral route was selected for the administration of the drug. Since the maximum volume of the drug that could be administered orally to mice is 1 ml, the extracts were so prepared that the maximum concentration of drug was within I ml volume only.

Materials required:

30 Albino mice weighing between 25-32 gms, Methanolic and ethanolic extracts, Sodium CMC solution of 2%w/v.

Protocol:

30 albino mice of either sex were selected and divided into 5 groups of 6 animals each of which one group served as control. Mice selected were kept for fasting for 18-24 hours giving water only ad libitum 2% sodium CMC was used as control. Both the extracts were taken in 2% sodium CMC, triturated well and made into fine paste. They are then made upto required volume with water. Ecah group having 6 mice were administered with one low (1000g) and one high (5000g) of the extracts orally and the Percentage mortality was observed for 72 hours. The observations are given in the Table No1.

Screenings for Anti- inflammatory Activity:

Carragenan paw odema method:

The anti-inflammatory activity of ethanol and methanolic extracts were determined by Carrageenan induced rat hind paw odema using plethysmograph 3. Albino rats of either sex weighing between 150-250 gms were divided into four groups and each group contained 6 animals. Group 1 seaved as control, group 2 served as standard and received 50mg/kg body weight of diclofenac sodium orally. Group 3 and 4 served as test and received 17.5mg/kg body weight of dried ethanolic and methanolic extracts respectively(500mg/kg body wt). Normal saline , diclofenac sodium(50 mg/kg body wt) and extracts were administered one hour before carrageenan administration.1%w/v in the normal

saline was injected into sub plantar region of the left hind paw of all the groups of animals and right hind paw served as control. The volume of hind paw odema was measured by plethysmograph, at 1h, 2h, and 6h .Mean increase in paw volume and % inhibition of inflammation were calculated. The % inhibition of inflammation were calculated.The % inhibition produced by the extracts of Celastrus paniculatus was compared with the standard % inhibition was calculated by using the formula.The results are shown in Table No 2 and 3.

% of inhibition=100(1- VT/Vo) Where Vo = volume of the control (saline) Vt= volume of extract.

Results and discussion:

The pharmacological studies of methanolic and ethanolic extracts of Celastrus paniculatus seeds revealed that they have remarkable inhibition in the inflammation i.e. 60.02 and 70.04% at 4th hour.The comparision between ethanolic and methanolic extracts with standard diclofenac sodium are represented in the Table 1 and 2. From the data obtained it was concluded that Celastrus paniculatus seeds possess considerable antiinflammatory. The pharmacological studies carried out by us substantiate the use of Celastrus paniculatus as an anti-inflammatory drug. The adverse effects of the synthetic pain killers can be minimized by the use of extracts of Celastrus paniculatus.

Statistical analysis:

The results were reported as means +-- standard deviation. The difference between experimental groups were compared by t one way ANOVA (control) Vs treatment Bonferriones method and were considered statistically significant when $p<0.05$.

Table No.1: Toxicity study of Celastrus paniculatus.

Extract	Mean wt. in grams	No. of animals	Dose mg/kg body wt.	No of animals dead after 72 hours	No of animals survived after 72 hours
Methanol	24	06	1000	----	06
	26	06	5000		06
Alcohol	24.5	06	1000	----	06
	28.8	06	5000		06

Table No.2: Percentage inhibition of oedema at different time intervals of Celastrus paniculatus.

Sl.No.	Drug extract	Percentage inhibition of oedema at different time intervals					
		1	2	3	4	5	6
1.	Std.Diclofenac sodium	23.05	46.01	72.04	79.29	70.15	49.50
2.	Methanolic extract	13.03	32.37	40.91	60.02	47.02	29.30
3.	Alcoholic extract	18.92	23.27	46.33	70.04	60.75	39.40

Table No.3: Average oedema at different time intervals of Anti-inflammatory activity of Celastrus paniculatus.

Sl. No.	Drug extract	No of animals	Mean wt.of animals in gms	Dose mg/kg body wt.	Average oedema at different time intervals (hrs.)					
					1	2	3	4	5	6
1	Control	6	180.3		0.1597 to 0.002	0.2802 to 0.014	0.3540 to 0.032	0.3664 to 0.0032	0.2010 to 0.0025	0.0990 to 0.0017
2.	Std Diclofenac sodium	6	198.6	50	0.1229 to 0.017	0.1513to 0.056	0.0990 to 0.058	0.0759 to 0.0459	0.0600 to 0.033	0.0500 to 0.013
3.	Methanolic extract	6	170.5	500	0.1389 to 0.025	0.1895to 0.034	0.2092 to 0.043	0.1465 to 0.0508	0.1065 to 0.029	0.070 to 0.010
4.	Alcoholic extract	6	218.4	500	0.1295 to 0.029	0.2150to 0.036	0.1900 to 0.049	0.1098 to 0.0496	0.0789 to 0.037	0.060 to 0.011

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