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Research Article

EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF *EVOLVULUS ALSINOIDES* PLANT EXTRACTS

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ABSTRACT
The aim of the study was to highlight the anti-inflammatory activity of *Evolvulus alsinoids*, it belongs to the family *convolvulaceae* and commonly known as shankhpushpi. The chloroform and Ethylacetae extracts of the plant has significant anti-inflammatory activity by both methods that is carrageenan and formalin induced paw oedema in rats at 200 and 400mg/kg body weight. In both models ethyl acetate extract was showed maximum activity.
KEY WORDS: *Evolulus alsinoids*, Antiinflammatory, Carrageenan, Formalin, Chloroform, Ethyl acetate.

INTRODUCTION

It is a perennial, prostrate, small herb, with woody root stock. Leaves alternate, elliptic – oblong, clothed with sliky pubescence. Flowers are blue, solitary or in pairs with long pedicels, axillary. Fruit globose capsule. Common weed of open places, roadsides, grasslands and scrub jungles[1]. This plant has some traditional uses like hair growth, bronchitis and other different pharmacological activities such as gastro protective[2], antibacterial[3], antiulcer[4], immunoodilatory[5], cytoprotective[6], adaptogenic and antiamnesic[7], anxiolytic[8], diabetes[9] syphilis[10], veneral, tonic to brain strength, memory[11,] analgesic[12], and anti-inflammatory activity[12] has done only for ethanolic extract but in present study two solvent extracts are used to access the anti-inflammatory activity.

MATERIAL AND METHODS

The plant was collected from Sheshachala hills near by Rajiv Gandhi Institute of Medical Sciences Kadapa, Andhra Pradesh India. The plant was identified by Assistant professor Dr.Madhusudana Reddy Department of Botany, Yogivemana University, Kadapa, Andhara Pradesh, india. The specimen of the plant was stored in the department of pharmacology (specimen. No. TPCP/EV/10/2011). The collected whole plant was dried at room temperature under shade for seven days then the whole plant material was powdered by using mechanical mixer and sieved(40) material used for extraction and extractions were carried out by using soxhlet of 1000ml capacity round bottom flask. The extractions of whole plant were carried with, chloroform and ethylacetate until the solvent becomes colourless in the soxhlet and the extracts were concentrated under reduced pressure. The solvent free substances are mixed with are mixed with 1%v/v tween 80 and used for the experimentation. All the experimentations were performed according to the guidelines of CPCSEA and recommendations of the institutional animal ethics committee(IAEC) and the reference number is Rc.No.413/Acad/2011-2012.

Acute toxicity studies

The maximum non lethal dose was found to be 2000mg/kg body weight orally. The extracts were showed mortality. The determination of acute toxicity by adapting fixed dose, the guidelines of CPCSEA and 1/10th and 1/5th of LD_{50} , cut of values of the extracts were taken as a screening doses i.e 200 and 400mg/kg body weight

Pharmacological Screening

The albino wister rats (100-150g) of either sex were used for the study. They were acclimatized to normal laboratory conditions for one week under 12h light and dark cycle and the given pellet diet and U.V. purified filtered water. The extracts were administered orally and the dose was selected between the minimum effective dose and maximum non lethal dose i.e. 200 and 400mg/kg body weight.

Drugs and chemicals

Diclofenac, Formaldehyde 10% v/v, (*Source S.D. Fine chemicals)* Carrageenan (*Source:* Himedia, Lot No 0000112386 RM-1576, *Mfg date*, 04-2011).

Carrageenan induced paw oedema model in rats

Overnight fasted, albino Wistar rats weighing between 100 and 150 g were randomly divided into eight groups of five animals each, Group I positive control and received normal saline Group II served as standard diclofenac and, Group III to VI received the test extracts at 200 and 400 mg/ kg through oral route. After 30 min of drug administration, 0.1 ml of 1% w/v suspension of carrageenan was injected into the sub-plantar region of the right hind paw of each rat[13,14]. The paw volume is measured plethysmographically immediately after injection, again at 30, 60,120, 180 and 240 min interval. The values are dipicted in Table 1,2.

Formalin induced paw oedema model in rats:

Overnight fasted, albino Wistar rats weighing between 100 and 150 g were randomly divided into eight groups of five animals each. Group I positive control and received normal saline Group II served as standard diclofenac and, Group III to VIII received the test extracts at 200 and 400 mg/ kg through oral route. After 30 min of drug administration 0.1 ml of 10% v/v solution of formalin was injected into the sub-plantar region of the right hind paw of each rat. The paw volume is measured plethysmographically immediately after

injection[13,14], again at 30, 60,120 and 180 min interval. The values are depicted in Table 3,4.

RESULTS

The extracts of *Evolvulus alsinoids* exhibited significant anti-inflammatory activity when compared with 0 time intervals. The results and the percentage inhibitions are depicted in the tables 1,2,3,4 and represented in graphs i.e Figures 1,2.

Table 1: Anti-inflammatory activity of *Evolvulus alsinoides* whole plant extracts by carrageenan induced paw edema in rats

Group	Dose (mg/kg)	Paw volume, ml after different time interval					
		0 min	30 min	60 min	120 min	180 min	240 min
Carageenan		0.84±0.03	1.43± 0.05	1.49±0.02	1.53±0.04	1.60±0.04	1.64±0.07
Diclofenac	12.5	0.80±0.03	1.06±0.03 [b]	1.12±0.05 [b]	1.17±0.06 [b]	1.11±0.08 [c]	0.90±0.03 [c]
WCE	200	0.92±0.03	0.98±0.03	1.06±0.07 [b]	1.10 ±0.08 [c]	1.12 ±0.05	0.94 ±0.10 [c]
WCE	400	0.74±0.06	0.82±0.06	0.96±0.05 [c]	1.02±0.05 [c]	0.93±0.05	0.80±0.08
WEE	200	0.82±0.02	0.90±0.08	0.92±0.05 [b]	1.04±0.10 [b]	1.10±0.14 [a]	1.06±0.07 [a]
WEE	400	0.86±0.02	0.90±0.03 [a]	0.98±0.04 [c]	1.20±0.09	1.14±0.01	0.95±0.02

Values are expressed in MEAN±S.E.M. for five animals each group. ANOVA followed by Tukeys multiple comparison test. Values are statically [a]p<0.05, [b]p<0.01, and [c]p<0.001 when compared with 0 min interval.

Table 2: Percentage protection of the *Evolvulus alsinoides* whole plant extracts by carrageenan induced paw edema in rats

Group	Dose (mg/kg)	% protection				
		30min	60min	120min	180min	240min
Control	-	-	-	-	-	-
Diclofenac		24.5	28.5	31.6	27.9	11.1
WCE	200	6.1	13.2	16.3	17.6	2.1
WCE	400	8	22.9	27.4	20.4	7.5
WEE	200	8.8	10.8	21.1	25.4	22.6
WEE	400	4.4	12.2	28.3	24.5	9.4

Table 3: Anti-inflammatory activity of *Evolvulus alsinoides* whole plant extracts on Formalin induced paw edema in rats

Group	Dose (mg/kg)	Paw volume, ml after different time interval				
		0 min	30 min	60 min	120 min	180 min
Carageenan		1.21±0.16	1.69±0.10	1.64±0.13	1.77±0.09	1.75±0.02
Diclofenac	12.5	1.20±0.08	1.57±0.09[a]	1.74±0.05	1.51±0.05[b]	1.41±0.05 [b]
WCE	100	1.26±0.02	1.34±0.18	1.40±0.20 [a]	1.31±0.14[c]	1.30±0.14 [c]
WCE	200	1.22±0.09	1.45±0.17	1.48±0.10	1.55±0.10	1.35±0.071
WEE	100	1.22±0.09	1.47±0.17	1.50±0.07 [a]	1.35±0.10[b]	1.26±0.10[b]
WEE	200	1.29±0.02	1.49±0.13	1.66±0.10	1.60±0.12	1.50±0.05

Values are expressed in MEAN±S.E.M. for five animals each group. ANOVA followed by Tukeys multiple comparison test. Values are statically [a]p<0.05, [b]p<0.01, and [c]p<0.001 when compared with 0 min interval.

Table 4: Percentage protection of the *Evolvulus alsinoides* whole plant extracts by Formalin induced paw edema in rats

Group	Dose (mg/kg)	% protection			
		30min	60min	120min	180min
Control	-	-	-	-	-
Diclofenac		21.5	23.5	20.5	14.1
WCE	200	5.9	10	3.8	3
WCE	400	15.8	17.5	21.2	9.6
WEE	200	16.7	18.6	9.6	3.1
WEE	400	13.4	22.2	19.3	14.8

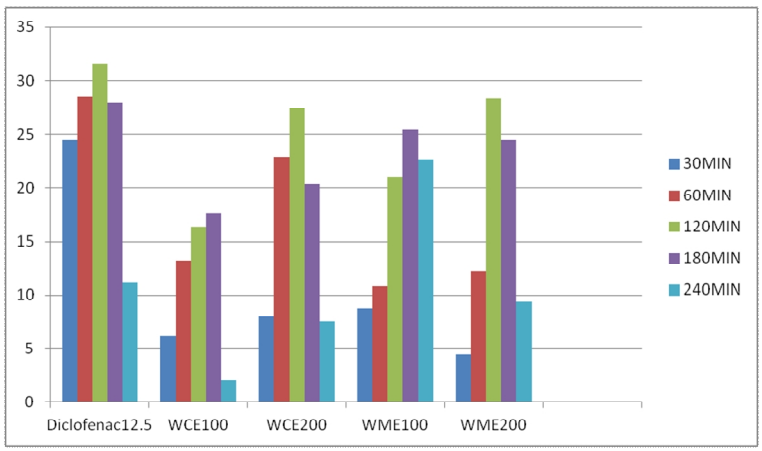

Figure 1: Percentage protection of the *Evolvulus alsinoides* whole plant extracts

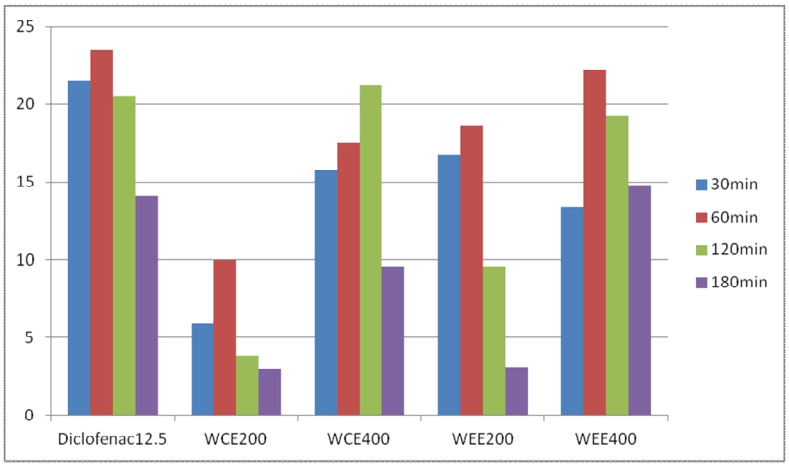

Figure 2: Percentage protection of the *Evolvulus alsinoides* whole plant extracts by Formalin induced paw edema in rats

DISCUSSION

The phytochemical studies reveals that the presence of alkaloids, glycosides, saponins, terpinoids[16]. The dose was decided as 200 and 400 mg/kg body weight from acute toxicological studies. The anti-inflammatory activity of ethanolic extract was showed significant inhibition[12]. In the present study the chloroform and ethyl acetate extracts were showed graded dose response. The chloroform, ethyl acetate extracts were protected 27.4% and 28.3% at 120min, it indicates that *Evolvulus alsinoids* extracts are considerably reduced the inflammation but when compared with standard drug at 12.5mg/kg body weight was not that much potent drug, but the extracts were reduced the inflammation caused by prostaglandins(PG), histamine and 5- hydroxy tryptamine at intial stage, later stage is not that much acceptable which is caused by many factors.

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