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Research Article

IN-VIVO ANTI-INFLAMMATORY ACTIVITY OF *STROBILANTHES CILIATUS* NEES

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ABSTRACT

The anti-inflammatory activity ofethanolic extract of *Strobilanthes ciliatus* aerial parts was studied using carrageenan induced paw oedema model in wistarrats. The test extract (200, 400 and 800 mg/kg,p.o) showed significant anti-inflammatory activity when compared to standard drug diclofenac and vehicle control.

Keywords: *Strobilanthes ciliatus,* aerial parts, paw edema, anti-inflammatory, diclofenac.

INTRODUCTION

The composition of the internal environment is maintained within narrow limits, and this fairly constant stateis called *homeostasis.* Despite the progress made in medical research during the past decades, treatment of many serious diseases is still problematic. The most common presentation of patient to the doctor is pain and inflammation. Inflammation is a host defence mechanism of the body and it's an essential immune response that enables the body to survival during infection or injury and maintains tissue homeostasis in noxious conditions. But in some conditions appears to be no resolution and a chronic state of inflammation develops that may last the life of the individual. Such conditions include the inflammatory disorders osteoarthritis, rheumatoid arthritis, inflammatory bowel diseases, retinitis, multiple sclerosis psoriasis and atherosclerosis[1]. Treatment of inflammation is adebate as the conventional NSAIDS are commonest to cause Adverse Drug Reactions. Hence there is ongoing research to develop safer and more effective drugs for the therapy of inflammation. Traditional plants play a very important role in the discovery of new drugs.

Strobilanthes ciliatus of Acanthaceae family is a highly potential medicinal plant in ayurveda in the treatment of inflammatory disorders [2,3]. As per literature survey information, there is no scientific evidence of pharmacological activity of the plant. Hence, the present study has been undertaken to evaluate the *in-vivo* anti-inflammatory activity of *Strobilanthes ciliatus*.

MATERIALS AND METHODS

Plant material

The aerial parts of *Strobilanthes ciliatus* were collected from Nilambur, Mallapuram district, Kerala, India, identified and authenticated. The sample specimen was deposited, at the Department of Pharmacology, Chalapathi Institute of Pharmaceutical Sciences, Lam, Guntur, Andhra Pradesh, India.

Preparation of plant extracts[4]

Air dried pieces of aerial parts of *Strobilanthes ciliates* was thoroughly cold percolated and extracted with ethanol (60- 80 ^{o} C) for 72 hours. The extraction was filtered, concentrated and stored in the dark at +4^{0}C until tested.

Qualitative phytochemical analysis [5]

The preliminary chemical tests were carried out for the ethanolic extract of *Strobilanthes ciliatus* to identify the presence of various phytoconstituents.

IN-VIVO STUDIES

Experimental animals

Adult Wistar albino rats (150-180 g) of either sex were procured from the laboratory animal house, Chalapathi institute of pharmaceutical sciences, Guntur, Andhra Pradesh, India and used in the study. The animals were kept under standard environmental conditions of room temperature (220 ±20C), relative humidity (50% ± 5%) and 12 h light and dark cycle. The animals were housed in the rat cages and provided feed (commercial pellets contain a balanced ration obtained from the

Sri Venkateswara Enterprises, Bangalore) and water *ad libitum.* All the animals were acclimatized to the laboratory environment 5 days prior to the experiment. The animals were fasted overnight just prior to the experiment but allowed free access to drinking water. All the experiments were carried out in accordance with the guidelines of the Institutional Animal Ethics Committee. The study was conducted after obtaining ethical committee clearance from the Institutional Animal Ethics Committee.

I. Acute toxicity study

3 female Wistar rats were selected for the study. The overnight fasted animals (with water *ad libitum*) were administered with ethanolic extract of *Strobilanthes ciliatus* at a single dose of 2000 mg/kg body weight by orally. The dose volume was fixed at10ml per kg body weight. The animals are observed for 0min, 30 min, 1 hr, 2hr, 4hr, 6hr, and thereafter every day for 14 days. Food was withheld for a further 3-4 hours after administration of test extract and was observed for signs of toxicity. The body weight of the rats before and after administration are noted that changes in skin and fur, eyes, mucous membranes, respiratory, circulatory, autonomic and central nervous system and motor activity and behavior pattern was observed and also sign of tremors, convulsions, salivation, diarrhoea, lethargy, sleep and coma were noted. At the end of the 14th day the animals were sacrificed with excessive ether anesthesia and dissected for examination of vital organs like brain, liver, kidney, lungs, and heart for pathological changes. For further confirmation the above procedure was repeated on another set of 3 female Wistar rats [6].

2. Efficacy studies

Anti-inflammatory activity

Carrageenan induced rat paw edema method[7]

5 groups was formed with 6 wistar rats in each group.

Test agent (Ethanolic extract of aerial parts of *Strobilanthes ciliatus*) and diclofenac (100mg/kg) were administered (p.o) 30 minutes before 1% carrageenan injection (0.1ml) into the sub plantar area of the right hind paw. The volumes of injected and contralateral paws were measured 1, 2 and 3 hours after induction of edema by using digital plethysmometer (Inco, Chennai). The treatment was given in the following manner:

I Group – Control (Normal saline 10 ml/kg, p.o)
II Group – Strobilanthes ciliatus(200 mg/kg,p.o)
III Group – Strobilanthes ciliatus(400 mg/kg,p.o)
IV Group – Strobilanthes ciliatus(800 mg/kg,p.o)
V Group – Diclofenac (100 mg/kg,p.o).

Statistical analysis

Results was analysed by one way ANOVA, followed by Turkey's multiple comparison test, 'p' value less than 0.05 was taken as significant (Table 1).

Table 1: Anti-inflammatory action of ethanolic extract of *Strobilanthes ciliates* aerial – parts in carrageenan induced rat paw edema

Group	Dose (mg/kg,p.o)	Swelling volume (ml)		
		1(h)	2(h)	3(h)
Control	10	1.51±0.03	1.56±0.01	1.62±0.17
Strobilanthes ciliatus	200	1.12±0.09*	1.30±0.05*	1.34±0.03*
Strobilanthes ciliatus	400	0.93±0.04*	1.17±0.08*	1.19±0.02*
Strobilanthes ciliatus	800	0.85±0.01*	0.95±0.07**	0.98±0.05*
Diclofenac	100	1.08±0.02**	0.99±0.04**	0.91±0.06*

Values are expressed as Mean ±S.E.M. p*<0.05, p**<0.01 considered significant (n=6) when compared to control.

RESULTS AND DISCUSSION

Preliminary phytochemical analysis revealed the presence of carbohydrates, triterepenoids, phytosterols, flavonoids, and tannins in the ethanolic extract of the aerial parts of *Strobilanthes ciliatus*.

The ethanolic extract of the aerial parts of *Strobilanthes ciliatus* was found to be safe and no mortality of the rats was observed at the dose of 2000mg/kg for 14 days in acute toxicity study. So the LD_{50} of the Strobilanthesciliatus will be > 2000mg/kg body weight.

The ethanolic extract of the aerial parts of *Strobilanthes ciliatus* (200, 400, 800 mg/kg, p.o) showed dose dependent reduction of carrageenan induced paw edema in rats when compared to control. The lower the rat paws volume the better the anti-inflammatory activity.

The standard drug Diclofenac (100 mg/kg,p.o) produced inhibitory activity which was close to that ofethanolic extract of the aerial parts of *Strobilanthes ciliatus*(Table 1). All the treatments were significant (p<0.05, p<0.01).

CONCLUSION

The present study showed that ethanolic extract of aerial parts of *Strobilanthes ciliates* can be effectively used as a anti-inflammatory agent.

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