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Antiinflammatory Activity of *Sarcostemma brevistigma* in Rats

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Accepted 6 December 2002

Revised 15 November 2002

Received 6 May 2002

The effect of ethyl acetate extract of *Sarcostemma brevistigma* was investigated in rat to evaluate the antiinflammatory activity. Carrageenin-induced rat paw edema model and cotton pellet granuloma methods were employed to test antiinflammatory activity. The ethyl acetate extract (650 mg/kg) produced the inhibition of carrageenin-induced rat paw edema and also found to be effective in cotton pellet granuloma studies. The result indicated that the ethyl acetate extract produced significant ($P < 0.001$) antiinflammatory activity when compared to control.

Sarcostemma brevistigma Wight, a plant belonging to the family Asclepiadaceae, grows throughout India and other tropical regions of the world. It is found to be active in rheumatic disease and was also used as an anti-allergenic, emetic and bronchodilator¹. Phytochemical evaluation revealed the presence of bregenin, brevine, brevinine, sarcogenin and sarcobiose^{2,4}. Prolonged use of both steroidal and non-steroidal antiinflammatory drugs are well known to be associated with peptic ulcer formation⁵. Hence, search for new antiinflammatory agents that retain therapeutic efficacy and yet are devoid of these adverse effects are justified. In this context the present study is focused to evaluate antiinflammatory activity of *S. brevistigma*.

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The stems of *S. brevistigma* were collected from Perundurai, Erode district and were authenticated at the Botanical survey of India, Coimbatore. The stems were dried in shade and powdered. The powder was extracted successively with ethyl acetate using a Soxhlet apparatus. The extract was evaporated under vacuum. Extractive value (% w/w) of ethyl acetate dry extract was 5.4.

Male Wistar rats weighing between 150-175 g bred in King Institute, Guindy, Chennai were selected for antiinflammatory studies. The rats were divided into 3 groups, each group consisting of 6 animals. One group served as negative control (received 5% gum acacia 5 ml/kg), second group served as positive control (received indomethacin 10 mg/kg), while third groups received ethyl acetate extract of *S.*

TABLE 1: EFFECT OF ETHYL ACETATE EXTRACT OF *S. BREVISTIGMA* ON CARRAGEENIN-INDUCED RAT PAW EDEMA.

Treatments	Dose (mg/kg, p.o.)	Increase in paw volume (ml)	% Decrease in paw volume
Control (5% Gum acacia)	5	0.52±0.02	-
indomethacin	10	0.18±0.02*	65.4
Ethyl acetate extract of <i>S. brevistigma</i>	650	0.26±0.04*	50.0

Numbers of animal in each group were 6. *P< 0.001 when compared to control. Values are expressed as mean ± SEM. Data were analyzed using student's 't' test.

brevistigma (650 mg/kg) by oral route.

Edema was produced by the method described by Winter *et al.*⁶. The Institutional Animal Ethics Committee has approved the animal experimental protocols. An injection was made of 0.1 ml of 1% carrageenin (Sigma Chemical Co, St. Louis, USA) suspension into the right hind paw of each rat in the plantar region. The paw volume was measured at 0 and 3 h after injection of carrageenin. The plethysmograph apparatus used for the measurement of rat paw volume was that of Buttle *et al.*⁷ as modified by Singh and Ghosh⁸. Drug pretreatment was given 1 h before the injection of carrageenin. Percent inhibition of edema was calculated.

In Cotton Pellet Granuloma model, Wistar rats were divided in 3 groups as described under the description for carrageenin-induced edema model. After shaving the fur on the back, the rats were anaesthetized with pentobarbitone (30 mg/kg, s.c.). Through a single midline incision on the dorsal surface, sterilized pre weighed cotton pellets were implanted in both axillae and groin regions according to the method of D'Arcy *et al.*⁹ with a slight modification. The drugs were administered daily for 10 d (0 to 9 d). On day 10 the pellets were dissected out, dried at 60° and the dry weights were determined.

The effect of ethyl acetate extract of *S. brevistigma* on carrageenin-induced edema in rats is shown in Table 1. Edema suppressant effect of ethyl acetate extract was 50 percent, which was nearly equivalent of that of 10 mg/kg of indomethacin. The edema suppressant effect was significant (P<0.001) at the dose of 650 mg/kg of ethyl acetate extract when compared to control. Table 2 shows the effect of drug treatment on the mean weights of cotton pellet. The ethyl acetate extract at a dose 650 mg/kg inhibited the granuloma tissue formation. The inhibitory effect of the ethyl acetate extract was found to be almost similar to that of 10 mg/kg of indomethacin.

Carrageenin-induced paw edema was taken as a prototype of exudative phase of inflammation. The development of edema has been described as biphasic¹⁰. The initial phase is due to the release of histamine, serotonin and kinins in the first hour after injection of carrageenin. More pronounced second phase is related to the release of prostaglandin-like substances in 2-3 h. The significant antiinflammatory effect of ethyl acetate extract of *S. brevistigma*, may be due to an inhibitory effect exert predominantly on the mediators of inflammation induced by the phlogogenic stimuli. In the cotton pellet granuloma model, inflammation and granuloma develops during a period of several days. This model is an

TABLE 2. EFFECT OF ETHYL ACETATE EXTRACT OF *S. BREVISTIGMA* ON COTTON PELLETT-INDUCED GRANULOMA.

Treatment	Dose (mg/kg, p.o.)	Granuloma weight (mg, dry wt)	% Inhibition
Control (5% Gum acacia)	5	56.7±1.45	-
Indomethacin	10	22.5±0.83*	60.3
Ethyl acetate extract of <i>S. brevistigma</i>	650	29.3±0.63*	48.3

Number of animals in each group were 6, *P<0.001 when compared to control. Values are expressed as mean ± SEM. Data were analyzed using student's 't' test.

indication for the proliferative phase of inflammation. Inflammation involves proliferation of macrophages, neutrophils and fibroblasts, which are basic sources for granuloma formation. Hence, decrease in the weight of granuloma indicates that the proliferative phase was effectively suppressed by the ethyl acetate extract of *S. brevistigma*. In conclusion, the present study demonstrate that *S. brevistigma* possessed remarkable antiinflammatory activity.

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