

ANTI-INFLAMMATORY ACTIVITY OF SOME INDIAN MEDICINAL PLANTS

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ABSTRACT: The anti-inflammatory activity of some of the medicinal plants were assayed at a dose of 1000 mg/kg b.wt. in male albino rats using Carrageenin induced rat raw edema. Among the fifteen medicinal plants were found to be highly effective which are discussed in this paper.

Introduction

Inflammation is associated with the Cardinal signs of redness, heat, pain, and swelling (Ebert, 1977). When tissue is injured the body adopts this mechanism to contain the inflammation and repair the damaged tissue. If the inflammation subsides within a few days, it is known as acute inflammation. The mediators of inflammation are histamine, kinin, system and prostaglandins, (Arrigoni-Martelli, 1977). The earlier phase of Carrageenin inflammation in maintained by histamine and kinin system, and sustained inflammation is maintained by prostaglandin (Di Rosa e al., 1971). When the tissue is injured with a noxious agent, leukocytes migrate to the inflamed site and wage a war to neutralize the ill effects of the foreign agent (Saxene, 1980; Schiathi, 1970).

In the process, the lysosomes present in these cells get damaged resulting in the release of the hydrolytic enzymes that cause extensive damage to the surrounding tissue (Anderson et al., 1971; Higgs et al.m 1975). This gives a fairly simpler picture of inflammation.

It has been found that major mechanism involved in the Anti-inflammatory compounds are through

- a) Inhibition of synthesis of prostaglandin
- b) Stabilization of lysosomal membranes
- c) Inhibition of connective tissue metabolism.

Fifteen drugs comprising siddha medicinal plants were screened for anti-inflammatory activity in Carrageenin induced inflammation in rats (Winter et al., 1962). The screened medicinal plants are:-

- 1) Albizzia lebbeck Benth.
- 2) Solanum xanthocarpum Schrad & Wendl.
- 3) Hibiscus rosa sinensis Linn.
- 4) Myristica fragrans Houtt.
- 5) Celastrus Paniculatus Wild.
- 6) Alangium Salvifolijum (Linn. F).
- 7) Calophyllum inophyllum Linn
- 8) Alpinia speciosa schum.
- 9) Aloe Vera Linn
- 10) Evolvulus alsinoides Linn.
- 11) Vitex negundo Linn.

- 12) *Erythrina indica* Linn.
- 13) *Sida acuta* Burm.
- 14) *Hemidesmus indicus* R. Br.
- 15) *Cassia fistula* Linn.

Among the fifteen medicinal plants, the first six medicinal plants were found to be highly effective.

Methods

Male wistar albino rats from inbred stock weighing approximately 150g were used throughout the experiments. They were given commercial diet (Hindustan Lever Ltd., Bangalore) and tap water ad libitum. For each experiment, rats were randomly selected into groups comprising 6-8 animals.

Plant Material

All the fifteen medicinal plants were collected in the month of November from the herbal garden complex of Tamil University. They were identified by a pharmacognosist and voucher specimens have been deposited at the Herbarium, Tamil University, Thanjavur. The parts of the plants used are mentioned in the Table. The air dried powder of the plant materials was given to animals orally at a dose of 100 mg/kg b.wt at 24 and 1h prior to carrageenin injection by suspending in 2% gum acacia solution. The animals in the control group received orally 2% gum acacia solution.

Carrageenin pedal Edema

Edema was induced by injecting 0.1 ml of 2% Carrageenin in physiological saline/100 g.b wt into the subplantar tissues of the hind paw of rats. Swelling of the

carrageenin injected and the contralateral saline injected feet was measured at +1h and +5 1/2 h by the mercury displacement method (Winter et al., 1962), and percent anti-inflammatory activity was calculated. Phenylbutazone, a non-steroidal anti-inflammatory drug was also tested as a reference compound.

Results and discussion

Carrageenin induced inflammation is useful to detect anti-inflammatory agent (Di Rosa et al., 1971). Edema which develops after carrageenin injection is a biphasic event (Vinegar et al., 1969). The initial phase is attributed to the release of histamine and serotonin (Crunkhon and Meacock, 1971). The edema maintained between the first and second phase is due to kinin like substances (Crunkhon and Meacock, 1971); Di Rosa and Sorrentino, 1968; Van Alman et al., 1965). The second phase is said to be promoted by prostaglandin

TABLE

S.no.	Name of the drug	Dose mg/Kg .b.w	% of 1h	Anti-inflammatory activity at 5 1/2 h
1	<i>Albizia lebbek</i> (L)	1000	-	31
2	<i>Solanum xanthocarpum</i> (L)	1000	29	23
3	<i>Hibiscus rosa sinensis</i> (F1)	1000	30	23
4	<i>Myristica fragrans</i> (F)	1000	28	69
5	<i>Celastrus Paniculatus</i> (W)	1000	13	42
6	<i>Alangium Salvifolijum</i> (S)	1000	36	31
7	<i>Calophyllum inophyllum</i> (S)	1000	-	-
8	<i>Alpinia speciosa</i> (R)	1000m	-	-
9	<i>Aloe Vera</i> (J)	1000	-	-
10	<i>Evolvulus alsinoides</i> (W)	1000	-	-
11	<i>Vitex negundo</i> (L)	1000	6	-
12	<i>Erythrina indica</i> (L)	1000	-	9.4
13	<i>Sida acuta</i> (W)	1000	7	12
14	<i>Hemidesmus indicus</i> (W)	1000	5	11
15	<i>Cassia fistula</i> (T)(L)	1000	-	2
	Phenylbutazon	100	40	75

L=leaves F1=flowers F=fruits W=whole plant

S=seeds J=Juice R=roots

Like substances (Vinegar et al., 1969). It has been reported that the second phase of edema is sensitive to drugs like hydrocortisone, phenylbutazone and indomethacin (Vinegar et al., 1969; Di Rosa et al., 1971 and Levy, 1971). From the Table, it can be understood that Myristica fragrans fruit powder (69%), celastrus paniculatus seed powder (42%) and Albizzia lebeck leaf powder (31%) exert maximum anti-inflammatory activity at the second phase of Carrageenin inflammation. Solamnu Xanthocarpum leaf powder (29%), Hibiscus rosa sinensis flower powder (30%) and Alangium salvifonium seed powder (36%) have moderate effect at the first phase of Carrageenin inflammation. The other medical plants left behind were not effective at any of the phases.

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