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Research Article

Evaluation of the Ethanolic Extract of *Ficusvirens* Bark Carrageenan-Induced Anti-Inflammatory Activity in Swiss Albino Mice

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ABSTRACT

The purpose of this study was to investigate if an ethanolic extract of *Ficusvirens* bark may potentially reduce inflammation in mice that had been caused by carrageenan. 60 minutes before to receiving an injection of 0.1 mL of 1% carrageenan, Swiss albino mice were given oral treatments with normal saline (as the control group) and Ficusvirens extract (200 and 400 mg/kg). Paw volume was measured before, one, two, and three hours after the carrageenan injection. The Mean was used to express the findings ±SEM and the statistical significance of group differences were examined using One Way Analysis of Variance (ANOVA) and Dunnett's test, respectively. The mice's paw edoema was triggered by the sub plantar injection of carrageenan and was time-dependent. *Ficusvirens* extract (100 and 200 mg/kg) given orally at 1, 2, and 3 hrs after carrageenan injection decreased paw swelling dose-dependently. The results of the current study lead us to the conclusion that *Ficusvirens* extract has great anti-inflammatory effects on mice.

Keywords: *Ficus virens*, Anti-inflammatory, Carrageenan, Ibuprofen and Ethanolic extract.

INTRODUCTION

The raw components for both conventional (such as Ayurvedic, Chinese, Unani, Homoeopathy, and Siddha) and contemporary medicine come from medicinal plants. Plant products are now used as household cures, over-the-counter medications, and pharmaceutical industry chemicals in both industrialised and developing nations. As a result, they account for a sizeable share of the worldwide drug market. The majority of rural inhabitants, particularly in developing nations, rely on medicinal plants as their primary source of healthcare. Even if the majority of medicinal plants aren't suitable for ingestion in their unprocessed form, preparations that are are created in accordance with pharmacopoeia guidelines. The medicinal potential of a herbal medication depends on its form, whether it be isolated active ingredients, simple extracts, or plant pieces. Herbal treatments are made from fragments of plants or unpurified plant extracts that include a variety of active ingredients that frequently interact favourably [1,2].

The local reaction of living mammalian tissues to harm caused by any substance is known as inflammation. The clearance of the necrosed cells and tissues follows the body's defensive reaction to stop or slow the spread of the harmful chemical [3,4].

The following are possible inflammatory agents [5]: a) Parasites, fungus, bacteria, viruses, and their toxins are examples of infectious agents. b) Immunological substances such as cell-mediated and antibody responses to antigens. c) Physical irritants such as radiation, heat, cold, and mechanical stress. d) Organic and inorganic poisons are examples of chemical agents. e) inert substances, such as alien objects.Increased blood flow and vascular permeability, as well as the buildup of fluid, leukocytes, and inflammatory mediators like cytokines, are characteristics of inflammation in its acute phase. The establishment of particular humoral and cellular immune responses to pathogens present at the site of tissue injury characterises the sub-acute/chronic phase [6].

The Pakad tree, or *Ficusvirens* (Moreaceae), is found in India, Pakistan, China, and other tropical nations [7]. Methyl ricinolate, caffeic acid, bergenin, -sitosterol, and lanosterol are all present in the bark [8]. There are claims that the bark has antibacterial and antifungal properties. The phytochemical examination of the leaf extract reveals the presence of glycosides and tannins [9 10] categories of plants.

MATERIALS AND PROCEDURES

Authentication and Plant Material [11,12]

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In the Indian state of Telangana State, Hyderabad district, fresh bark from the *Ficusvirens* shrub was gathered. The plant was confirmed to be real, and a sample specimen of it was kept in the herbarium division of the pharmacy in Saharanpur. Initial cleaning of the bark with fresh water to remove clinging debris and foreign objects was followed by oven drying at 35 to 400C. The dry bark was ground into a powder, weighted, and then crushed. The extraction process employed the powder that had been weighed.

Preparation of extract

Using ethanol solvents over the course of 48 hours, the powdered medication was repeatedly extracted in a Soxhlet system. The extract was extracted, concentrated by evaporation, vacuum-dried, and used for its anti-inflammatory properties.

Chemicals

All of the chemicals were analytical-grade products made by Sigma or Merk.

Experimental animals

Throughout the entire investigation, Swiss albino mice (25–30g, any sexe) were employed. They were housed in typical polypropylene cages and kept in a controlled environment with a 12-hour light-dark cycle and room temperature. Water was available at all times, and the animals were fed a conventional laboratory diet. 12 hours prior to and throughout the experimental hours, food was withheld. The Institutional Animal Ethics CommitteeShadan Institute of Medical Sciences gave its approval to the experimental protocol.

Anti-inflammatory Activity Screening

Carrageenan caused mouse paw oedema [13]

According to the procedure outlined by Winter et al. (1962), the effect of oral administration of 100 and 200 mg/kg of the *Ficusvirens* extract, 40 mg/kg of ibuprofen, or vehicle (Saline, 10ml/kg) on the hind-paw oedema caused by sub plantar injection of 0.1ml Carrageenan (1% w/v) was assessed [11,12]. To put it simply, each rat had 0.1 mL of 1% w/v carrageenan injected into the sub plantar tissue of its left hind paw. Using a plethysmometer (UGO Basile, Italy), swelling of the carrageenan-injected foot was assessed at 0, 1, and 3 hours. A test extract was administered to the animals one hour prior to the carrageenan injection. The measurement was done before and three hours after the carrageenan injection. Percentage of test inhibition Analyses were used to determine the amount that the test medications inhibited the vehicle control (100%) [14].

Statistic Evaluation

The results, which were presented as Mean SEM, were analysed using One Way Analysis of Variance (ANOVA). Dunnett's test was used to further analyse the data, and P values of P0.01 and P0.05 were considered significant for mean differences.

RESULTS

Tables 1 demonstrate the anti-inflammatory efficacy of the extract of *Ficusvirens* bark against acute pedal oedema. These results demonstrated considerable anti-inflammatory activity and were equivalent to the control group. *Ficusvirens*ethanolic extract (200 mg/kg, p.o.) was found to have the strongest anti-inflammatory effects against carrageenan-induced hind paw oedema. *Ficusvirens* produced an inhibition of 78.40%.

Table 1:

Treatment(mg/kg)	Mean increase in paw volume(mL)				%Decrease in Paw volume at 3 h
	0 h	1 h	2 h	3 h	
Control	0.78 ±0.02	1.33±0.05	1.59±0.004	2.02±0.06	-
Ibuprofen(40)	0.70±0.05	1.07±0.01*	1.20±0.002**	1.38±0.01*	59.45
FicusViren Extract(100)	0.76±0.037	1.15±0.024**	1.51±0.12**	1.54±0.08**	60.65
FicusViren Extract(200)	0.74±0.046	1.10±0.051**	1.32±0.017**	1.41±0.05**	78.40

DISCUSSION

We studied the biological effects of Ficusvirens extracts, particularly those associated with the inflammatory process, in order to offer a scientific justification for the plant's traditional use.

The highly substantial reactions of certain extracts on suppressing the formation of oedema after carrageenan subplantar injection in the current data clearly shown that extracts of dried bark Ficusvirens have anti-inflammatory potential [15]. The extracts with the strongest anti-inflammatory activity also showed highly significant statistical values (P 0.01) for the suppression of carrageenan-induced edoema following phlogistic agent therapy.

The current investigation proves that Ficusvirens extracts have anti-inflammatory properties. The usage of carrageenan, a sulphated polysaccharide derived from seaweed (Rhodophyceae), can cause acute inflammation and is believed to be bi-phasic.

Histamine and serotonin are released during the initial stage. Bradykinin, protease, prostaglandin,

and lysosome are released during the second phase, which is what causes it. On the basis of this, it may be suggested that suppression of the first phase may result from a reduction in the release of early mediators like histamine and serotonin, while the effect of the second phase may be explained by a reduction in cyclo-oxygenase. These mediators contribute to the inflammatory response, stimulate the nociceptive system, and therefore lessen pain. According to reports, the majority of clinically useful anti-inflammatory medications are sensitive to the second stage of oedema, which has been employed frequently to access the anti-oedematous activity of natural products.9 It can be assumed that the inhibition of the inflammatory mediators may be the cause of the extract of Ficusvirens' ability to reduce carrageenan-induced inflammation in mice.

CONCLUSION

According to the aforementioned study, Ficusvirens bark extract is a promising anti-inflammatory.

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