

Anti-inflammatory effects of hydro-methanolic extract of *Ficus carica*

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ABSTRACT

In this article, we report for the efficiency of *Ficus carica* extract in the treatment against inflammation. The methanolic extract of *Ficus carica* leaves were investigated for the evaluation of their anti-inflammatory potential on formalin-induced paw oedema in Wister rats. Leaf extract of *Ficus carica* in dose 200mg/kg ($P < 0.05$) and 500mg/kg ($P < 0.001$) on orally administration gave significant reduction of rat paw oedema at all assessment times. The *Ficus carica* leaf extract showed maximum inhibition of 66.43% at the dose of 500mg/kg after 4 hrs. Where as the standard drug showed 70.78% of inhibition. These observations revealed that *Ficus carica* has significant anti-inflammatory property.

Key words: Antiinflammatory effects, *Ficus carica*, hydro-methanolic extract.

INTRODUCTION

Plant sources play an important role in modern and traditional system of medicine. The noteworthy contribution made by plant medicines to human health has lead to increased popular, official and commercial interest¹. It has been shown that in addition to the delightful edible fruits, *Ficus carica* (Fig) are used to lower glucose levels in diabetics and lower the levels of total cholesterol. It has been also used as stomachache. The leaves are added to boiling water and used as a steam bath for painful or swollen piles². The latex from the stems is used to treat corns, warts and piles^{2, 3, 4}.

It also has an analgesic effect against insect stings and bites.⁴ The fruit is mildly laxative, demulcent, digestive and pectoral.^{3, 6, 2} The unripe green fruits are cooked with other foods as a galactagogue and tonic². The roasted fruit is emollient and used as a poultice in the treatment of gumboils, dental abscesses etc.³ Syrup of figs, made from the fruit, is a well known and effective gentle laxative that is also suitable for the young and very old.⁵ A decoction of the young branches is an excellent pectoral.⁶ The plant *Ficus carica* has protective action against hepatic dysfunction⁷, antioxidant⁸ and anticancer properties².

The inflammatory reaction is a response of the organism against an injury and it involves the action of complex events and mediators through of the blood vessels⁹. It is a body defense reaction in order to eliminate or limit the spread of injurious agents¹⁰. The inflammatory reaction is characterized by blush, heat, pain and lost function. The inflammatory agent acts in the cell membranes inducing the activation of phospholipase A₂ and consequently, liberates arachidonic acid and metabolites. The inflammatory mediators such as cytokine, histamine, serotonin, leukotrienes and prostaglandin increase the vascular permeability to all on the migration leukocytes cells to act on the site of inflamed tissue.¹¹

MATERIAL AND METHODS

General

Aspirin (Ecosprin USV, limited, Mumbai India), General surgical materials, chemicals and instruments were obtained from the Jawaharlal Nehru Cancer Hospital & Research Center, Idgah Hills, Bhopal India. All reagents were of analytical grade and obtained from Merck.

Plant Material Extraction

50% methanolic leaf extract of, *Ficus carica* was prepared by the method of Suffness and Douros¹².

Animals & animal ethical committee approval

24 young male Wistar rats weighing between 350 -400 grams were used. The animals were kept, maintained in air conditioned animal house and fed on a standard diet of mouse food and water ad libitum, were used for the studies, accordance with institutional regulations and national criteria for animal experiments. The use of animals was as per CPCSEA norms (CPCSEA Registration no 500/01/a/CPCSEA/2001) Approval for experimental work was as per animal ethical committee of Research Jawaharlal Nehru Cancer Hospital & Research Centre, Idgah Hills, Bhopal 462001 India.

Acute toxicity studies

Male wister rats (350-400g) maintained under standard laboratory conditions were used. A total of five animal were used which received a single

oral dose (2000mg/kg, body weight) 50% methanolic leaf extract of, *Ficus carica* Animals were kept overnight fasting prior to drug administration. After the administration of leaves extract, food was withheld for further 3-4 hrs. All animals were observed individually during the first 30 minutes after dosing and periodically during the first 72 hrs for toxic symptoms and mortality.¹³

Anti-inflammatory activity

50% methanolic leaf extract of, *Ficus carica* was evaluated for anti-inflammatory activity by formalin-induced rat paw oedema method^{14,15}. 24 male wister rats (350-400g) were randomly distributed into four groups of six animals each. The first group served as a control (DDW only), second group served as the standard (Aspirin I.P Ecosprin USV, limited, Mumbai India 150mg/kg, orally), while the third and fourth group received 200mg/kg and 500mg/kg body weight of *Ficus carica* (50% methanolic leaf extract) respectively. After 1 hr, 0.05 ml of 1% formalin was injected into the sub-plantar region of the right hind paw to all the four groups. The paw volumes were measured using plethysmometer every hour till 4 hrs, after formalin injection, and mean increase in paw volumes were noted. Oedema volumes in control (V_c) and in treatment groups (V_t) were calculated. The percentage inhibition was calculated by using the formula.¹⁶

$$\% \text{Inhibition} = 100 \times (1 - V_t / V_c)$$

Statistical analysis

The results are expressed as mean \pm S.E.M. The statistical analysis was performed by analysis of variance (ANOVA) followed by Post-hoc Dennett's test¹⁷. $P < 0.01$ implies significance.

RESULTS AND DISCUSSION

In acute toxicity study, it was found that the animals were safe up to a maximum dose of 2000 mg/kg body weight. There were no changes in normal behavioral pattern and no signs and symptoms of toxicocity and mortality were observed. The anti-inflammatory effect of 50% methanolic leaf extract of *Ficus carica* against formalin-induced paw oedema is shown in table no. 1. Leaf extract of *Ficus carica* in dose 200mg/kg ($P < 0.05$) and 500mg/kg

Table 1: Anti-inflammatory activity of 50% methanolic leaf extract of *Ficus carica* in formalin induced paw oedema

Treatment	Dose (mg/kg)	Mean increase in paw volume (ml) Mean \pm SEM	% inhibition
DDW only(control)	-	2.45 \pm 0.15	-
Standard drug Aspirin	150	0.72 \pm 0.17**	70.78
<i>Ficus carica</i>	200	1.02 \pm 0.12*	58.46
<i>Ficus carica</i>	500	0.83 \pm 0.15**	66.43

Results expressed as mean SEM (n=6), *p<0.05, **p<0.001

(P < 0.001) on orally administration gave significant reduction of rat paw oedema at all assessment times. The *Ficus carica* leaf extract showed maximum inhibition of 66.43% at the dose of 500mg/

kg after 4 hrs. Where as the standard drug Aspirin showed 70.78% of inhibition. These observations revealed that extract of *Ficus carica* has significant anti-inflammatory properties.

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