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Research Article

# ANTI- INFLAMMATORY ACTIVITY OF WHOLE PLANT OF *CANSCORA PERFOLIATA* LAM.

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**ABSTRACT**

This study was intended to evaluate the anti-inflammatory activity of ethanol extract of *Canscora perfoliata* whole plant in carrageenan induced paw edema in Wistar Albino rats at the dose level of 150 and 300mg/kg administrated orally. Ethanol extracts exhibit potent anti-inflammatory activity at 300 mg/kg at 3 hrs. after administration in compare with reference standard Indomethacin. This study establisted anti-inflammatory activity of whole plant of *Canscora perfoliata.*

**Keywords:** *Canscora perfolita,* inflammation, carrageenan, edema.

## INTRODUCTION

Inflamation is considered as a primary physiological defense mechanism that helps body to protect itself against infection, burn, toxic chemicals, allergens or other noxious stimuli, an uncontrolled and persistent inflammation may act as an etiologic factor for many of these chronic illness[1]. Although it is a defense mechanism, the complex events and mediators involved in the inflammatory reaction can easily be induced[2]. Currently, both steroidal anti-inflammatory drugs (NSAIDs) are used in the relief of inflammation. Steroids have an obvious role in the treatment of inflammatory diseases, but due to their toxicity, can only be used over short periods. Prolonged use of NSAIDs is also associated with severe side effects[3]. Therefore, the development of newer and more potent anti-inflammatory drugs with lesser side effects is necessary.

*Canscora perfoliata* Lam. is one of the medicinally important plant belongs to Gentianaceae. The juice prepared from the plant is given to treat any poisonous bites by palliyar tribals of Grizzled Giant Squirrel Wildlife Sanctuary, Sriviliputhur, Western Ghats, Tamil Nadu[4]. However, perusal of literature reveals that anti inflammatory activity of *Canscora perfoliata* is totally lacking and hence the presence investigation was undertaken. The main objective of the presence study is to evaluate the anti-inflammatory activity of *Canscora perfoliata* whole plant.

## MATERIALS AND METHODS

### Plant Material

The well grown and healthy whole plants of *Canscora perfoliata* Lam. were collected from the natural forests of Western Ghats at Thanniparai, Sriviliputhur, Virudhunagar District, Tamil Nadu. With the help of local flora, voucher specimens were identified and preserved in the Ethnopharmacology Unit, Research Department of Botany, V.O. Chidambaram College, Tuticorin, Tamil Nadu, for further reference.

### Preparation of plant extract for anti-inflammatory activity

The dried whole plants of *Canscora perfoliata* were powdered in a Wiley mill. Hundred grams of plant powder was packed in a Soxhlet apparatus and extracted with ethanol. The ethanol extract was concentrated in a rotary evaporator. The concentrated ethanol extract was used for anti-inflammatory activity.

### Animals

Adult Wistar Albino rats of either sex (150-200g) were used for the present investigation. Animals were housed under standard environmental conditions at temperature (25±2$^0$C) and light and dark (12:12 h). Rats were fed with standard pellet diet (Goldmohur brand, MS Hindustan lever Ltd., Mumbai, India) and water *ad libitum*.

### Acute toxicity study

Acute oral toxicity study was performed as per OECD-423 guidelines (acute toxic class method), albino rats (n=6) of either sex selected by random sampling were used for acute toxicity study [11]. The animals were kept fasting for overnight and provided only with water, after which the extracts were administered orally at 5mg/kg body weight by gastric intubations and observed for 14 days. If mortality was observed in two out of three animals, then the dose administered was assigned as toxic dose. If mortality was observed in one animal, then the same dose was repeated again to confirm the toxic dose. If mortality was not observed, the procedure was repeated for higher doses such as 50, 100 and 2000 mg/kg body weight.

### Anti-Inflammatory Activity

### Carrageenan induced hind paw edema

Albino rats of either sex weighing 150-200 grams were divided into four groups of six animals each. The dosage of the drugs administered to the different groups was as follows. Group I - Control (normal saline 0.5 ml/kg), Group - II and III - (150 mg/kg and *Canscora perfoliata* 300 mg/kg, p o.), Group IV – Indomethacin (10 mg/kg, p.o.). All the drugs were administered orally. Indomethacin served as the reference standard anti-inflammatory drug.

After one hour of the administration of the drugs, 0.1 ml of 1% W/V carrageenan solution in normal saline was injected into the sub plantar tissue of the left hind paw of the rat and the right hind paw was served as the control. The paw volume of the rats were measured in the digital plethysmograph (Ugo basile, Italy), at the end of 0 min., 60min., 120min., 180min., 240min., 360min., and 480min. The percentage increase in paw edema of the treated groups was compared with that of the control and the inhibitory effect of the drugs was studied. The relative potency of the drugs under investigation was calculated based upon the percentage inhibition of the inflammation.

Percentage inhibition = [(Vc-Vt)/Vc] × 100

Where, Vt the percentage represents the percentage difference in increased paw volume after the administration of test drugs to the rats and Vc represents difference of increased volume in the control groups.

**Statistical Analysis**

The data were analyzed using student's t-test statistical methods. For the statistical tests a *p* values of less than 0.001, 0.01 and 0.05 was taken as significant.

**Table 1: Effect of *Canscora perfoliata* whole plant extracts on the percentage inhibition of carrageenan induced paw edema**

| Parameter | Edema volume (ml) | | | | | % Inhibition after 180 min |
|---|---|---|---|---|---|---|
| Treatment | Dose mg/kg | 0 min | 60 min | 120 min | 180 min | |
| CONTROL (Group-I) | Normal saline | 28.41±1.74 | 69.56±1.43 | 88.34±1.51 | 136.59±1.34 | _ |
| *C. Perfoliata* Whole plant extract (Group-II) | 150 | 24.38±1.26 | 73.44±1.20 | 92.49±1.64 | 81.26±1.16 | 40.50 |
| *C. Perfoliata* Whole plant extract (Group-III) | 300 | 20.53±1.93 | 33.94±1.59* | 40.31±1.66** | 43.11±1.69*** | 68.43 |
| Indomethacin (Group-V) | 10 mg | 25.91±1.66 | 30.56±1.89** | 33.41±1.99** | 31.49±1.99** | 76.87 |

Each Value is SEM ± 5 individual observations * P < 0.05 ; ** P<0.01 *** P<0.001Compared normal control vs edema Control rats.

## RESULTS

The anti-inflammatory activity of extract of *Canscora perfoliata* whole plant was evaluated by Carrageenan-induced paw edema method in Albino rats. In Carrageenan-induced paw edema model, *C. perfoliata* whole plant of 150 and 300 mg/kg caused significant inhibition of paw edema by 40.50% and 71.93% ($p$<0.001) respectively, 3 hours after carrageenin administration (Table 1).

## DISCUSSION

In the present study, the anti-inflammatory activity of ethanol extract of *Canscora perfoliata* whole plant has been established. The extracts were found to significantly inhibit the carrageenan-induced rat paw edema, a test which has significant predictive value for anti-inflammatory agents acting by inhibiting the mediators of acute inflammation[5]. Carrageenan induced inflammation is useful in detecting orally active anti-inflammatory agents[6]. Edema formation due to carrageenan in the rat paw is a biphasic event[7]. The initial phase is attributed to the release of histamine and serotonin[8]. The whole plant extracts of *Canscorea perfolita* possessed varying degree of anti-inflammatory activity when tested at various doses of 150 and 300 mg/kg. The ethanol extract at the dose of 300mg/kg showed high anti-inflammatory activity at 3h, where it cause 68.43%- inhibition, as compared to that of 10 mg/kg of indomethacin (76.87%).

5-Amyrin trimethylrilyl ether, phytol, Azulene, 1,2,3,5,6,7,8,8a. Octahydro-1,4-dimethyl-7(1-methylethenyl)-[1S-(1á,7á, 8aá)], cedarn-diol,8S, 14-, Hesperetin and cholestan-3-01,2-methylene-(3 á', 5 á)- were reported in the ethanol extract of *Canscora perfoliata* whole plant by GC-MS analysis[9]. There compounds may have the role in anti inflammatory effect. Further studies may reveal the extract mechanisms of action responsible for the anti-inflammatory activities of *Canscora perfoliata.*

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