

## EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF PLANT *RIVEA ORNATA*

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### ABSTRACT

The aim of present study was to explore the probable anti -inflammatory effect of methanolic extract obtained from the plant *Rivea ornata*. Anti- inflammatory activity was studied by Carrageenan induced rat paw edema. The extract was administered orally in dose of 200 and 400 mg/kg/body weight to healthy animals. These extract showed a greater anti inflammatory effect comparative to standard drug Indomethacin.

**Keywords:** Arial part, *Rivea ornata*, Anti-inflammatory, Indomethacin

### INTRODUCTION

The Phag, *Rivea ornata* (Family- Solanaceae) is one of unique Rivea species widely spread in tropical and subtropical countries<sup>1-2</sup>. A woody climber branchless stout, white-tomentose. Leaves ovate-cordate 3-5 in. diam. often broader than long, glabrous above, white silky-tomentose beneath while young; petiole 1-2 in. Flowers large, white, in short, mostly 3-fid. Peduncles; bracts 1/2 in. Fruit 2/3 in. diam., indehiscent, globose, shining, yellow-brown, nearly dries<sup>3-5</sup>. *Rivea ornata* seed oil was found to contain 12, 13-epoxy-octadec-cis-9-enoic acid (vernolic acid, 22.0%) along with the other normal fatty acids like palmitic acid (24.2%), stearic acid (8.9%), oleic acid (17.1%) and linoleic acid (27.8%)<sup>6-9</sup>. Juice of the plant-used topically in hemorrhagic diseases and piles<sup>10</sup>. The plant is not studied for anti-inflammatory activity. This study was aimed at providing pharmacologic basis for its folkloric use in inflammation and other species of Rivea were found to have anti- inflammatory activity. Based on this attempt has been made to evaluate the inflammation potency of *Rivea ornata*.

### MATERIALS AND METHODS

#### Plant material

The plant material was collected from the Tripura in the month of May 2011. The aerial parts were separated, dried, coarsely powdered passed through sieve no 40 and stored in a closed container for successive extraction.

#### Preparation of extract

The powdered plant material (450) was repeatedly extracted in a 5000 ml round bottomed flask with 2000 ml solvents starting with petroleum ether, chloroform, methanol and water. The reflux time for each solvent was 40 cycles. The methanolic extract was cooled at room temperature and evaporated to dryness under reduced pressure in rotary evaporator<sup>11</sup>.

#### Acute toxicity study

Doses of 30,100,200,400,1000,2000, and 5000mg/kg of extracts were administered orally to mice. The extract was given at doses of 200 and 400 mg/kg/day of body weight. All the animals found to be safe at doses of 5000mg/kg. Mice were then observed for incidence of mortality or any

sign of toxicity upto 24 h. The dosing schedule was followed as per OECD (Guideline 425)<sup>12</sup>

#### Animals

For Carrageenan induced hind paw edema Albino Wistar rats weighing between 150-200 g were divided into four groups of six animals each; Control (group 1) animals were administered saline, Group 2 animals were administered the methanolic extract lower dose, 200 mg/kg, Group 3 animals were administered the methanolic extract higher dose, 400 mg /kg, Group 4 animals were administered the Indomethacin (5 mg/kg).

#### Drug and chemicals

The methanolic extract of plant *Rivea ornata* was reconstituted using 0.5% w/v Sodium Carboxy Methyl Cellulose (SCMC). The suspension was freshly prepared before use. Carrageenan from Sigma Labs and all other chemicals, reagents used were of analytical grade.

#### Evaluation of anti-inflammatory activity

For Carrageenan induced hind paw edema Albino Wistar rats weighing between 170-200 g were divided into four groups of six animals each; Control (group 1) animals were administered saline orally for seven days, Group 2 animals were administered methanolic extract , smaller dose, 200 mg/kg orally for seven days, Group 3 animals were administered the methanolic extract of plant higher dose, 400 mg/kg orally for seven days, Group 4 animals were administered the Indomethacin 5 mg/kg orally for seven days as a standard drug<sup>13-15</sup> . Acute inflammation was induced in rats of all the groups were injected 0.1 ml of Carrageenan (1%) in normal saline into sub-planter area of right hind paws of rats. On the seventh day, the drugs were given orally 1 h prior to Carrageenan injection. Paw volume was measured by mercury plethysmograph at 0 and 3h after the Carrageenan injection<sup>16-17</sup>. Mean increase in the paw volume was measured and percentage inhibition was calculated.

Percentage inhibition = 100 (1-Vt/Vc); where, Vt=edema volume in control and Vt= edema volume in test/standard compound.

### RESULT AND DISCUSSION

The results show that methanolic extract at the dose of 400 mg/kg has significant reduction in the Carageenan induced paw oedema are given in Table 1. Extract of *Rivea ornata* at 200 mg/kg body weight per day when given orally as a suspension the paw volume were reduces by 51.35%

whereas in case of methanolic extract of at 400 mg/kg body weight per day shows 75.90 inhibition after 3h which indicate that effect manner. So 400 mg/kg dose methanolic extract exhibiting anti-inflammatory effect against acute inflammation.

Table 1: Effect of *Rivea ornata* leaves extracts on Carageenan-induced paw edema in rats.

Results were expressed as Mean SEM, \*P<0.001 by Student's t-test; P<0.05 by Student's t-test, N=6 animals per group.

Carageenan induced inflammation in rats is one of the most suitable acute model to screen anti-inflammatory

From this investigation it may be concluded that the methanolic extract of aerial parts of plant *Rivea ornata*

|                    |              | Inflammation(Δ in ml) |             |             |             |             |             | Percent inhibition Vt |
|--------------------|--------------|-----------------------|-------------|-------------|-------------|-------------|-------------|-----------------------|
| Treatments         | Dose (mg/kg) | 0 min                 | 15 min      | 30 min      | 60 min      | 120 min     | 180 min     |                       |
| control            | 0            | 0.46±0.008            | 0.59±0.007  | 0.78±0.01   | 0.79±0.01   | 0.87±0.005  | 0.95±0.005  | Vc 0.74               |
| Methanolic Extract | 200          | 0.43±0.01             | 0.36±0.009* | 0.35±0.005* | 0.34±0.008* | 0.32±0.01   | 0.36±0.007* | 51.35                 |
| Methanolic extract | 400          | 0.42±0.008*           | 0.19±0.01   | 0.13±0.007* | 0.12±0.01   | 0.11±0.008* | 0.10±0.008* | 75.90                 |
| Indomethacin       | 5            | 0.48±0.007            | 0.44±0.007  | 0.42±0.01   | 0.40±0.08   | 0.37±0.007  | 0.35±0.009  | 79.72                 |

agents. The development of Carageenan induced oedema is biphasic, the first phase is attributed to the release of histamine, 5-HT, and kinin, while, the second phase is release of prostaglandin. The observed effect may be due to inhibition of phlogistic mediators, antagonizing their interaction with their respective receptors or it may be due to general mechanism like increasing the membrane stability in the cell.

## CONCLUSION

showed anti-inflammatory effects, similar to those observed for non-steroidal drug such as Indomethacin. It is important to point out that the phytochemical analysis showed the presence of flavonoids and this might be responsible for anti-inflammatory activity. Further investigations are under process in our laboratory to isolate and characterize the specific active components of the plants extract which is responsible for observed pharmacological actions.

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