

**SCREENING OF THE ANTIINFLAMMATORY ACTIVITY OF “TRIANTHEMA PORTULACAISTRUM” IN ACUTE MODELS OF INFLAMMATION**Suresh S. Kendri<sup>1</sup>, Umesh G. Wari<sup>2</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT: BACKGROUND:** There are many anti-inflammatory drugs available but all of them do have a significant adverse effect profile. Trianthema portulacaistrum is known in Ayurveda since centuries for its medicinal values. So the current study was undertaken to evaluate the anti-inflammatory effects of this plant in acute inflammation. **MATERIALS AND METHODS:** Albino rats were treated with whole plant ethonolic extract of Trianthema portulacaistrum 100mg\kg, indomethacin 20mg\kg, orally with 2% gum acacia as suspending agent and the effects were observed in acute models of inflammation viz, carrageenin induced paw edema and formalin induced peritonitis. **RESULTS:** our study demonstrated that Trianthema portulacaistrum exhibited significant anti-inflammatory activity in both the models. **CONCLUSION:** Trianthema potrulacaistrum has got significant anti-inflammatory activity so further studies are needed in this direction.

**KEYWORDS:** Inflammation, Trianthema portulacaistrum, indomethacin, carrageenan.

**INTRODUCTION:** Inflammation is a defensive response mechanism of the body against the harmful stimuli. This process not only removes the injurious stimuli but also helps in initiating the wound healing process of the tissue.<sup>1</sup>

Trianthema portulacaistrum commonly known as bishakhapara is a prostrate glabrous, annual plant found almost throughout India. It is being used in Ayurveda since centuries because of its medicinal values.<sup>2</sup> It has got significant nutritional value as it contains the minerals like phosphorus, iron and potassium.<sup>3</sup> Its roots are used as cathartics, its leaves are helpful in treating edema and dropsy. Its also a useful antihelmintic.<sup>4,5</sup> So we took up this study to evaluate the anti-inflammatory activity of this plant.

**MATERIALS AND METHODS:** Whole plant ethonolic extract of the plant Trianthema portulacaistrum in the dose of 100mg\kg, Indomethacin<sup>6</sup> in dose of 20mg\kg and gum acacia 2% as a suspending agent were used for the study.

**PREPARATION OF THE PLANT EXTRACT:** The whole plant was collected and kept for drying. The dried whole plant was finely powdered and subjected to extraction process with the help of a Soxhlet extraction apparatus with ethyl alcohol being used as a solvent.

Albino wistar rats of either sex of average weight 120 to 200gms which were inbred in the central animal house, were used for experiment. The study was done after getting the clearance of institutional animal ethical committee.

All the animals were allowed food and water ad libitum both being withdrawn just before experiment. The animals were housed in a polypropylene cage under standard conditions in dim light and noise free room.

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The above animals were divided into two major groups, one for the carrageenin induced inflammation and the other for formalin induced peritonitis.

**Carrageenin induced rat paw edema Model:** In this model the first group of rats were subdivided into three groups of six rats each. One acted as control which was treated with gum acacia 2% orally, another group received the standard drug indomethacin in the dose of 20mg/kg per orally, the remaining group was treated with test compound i.e. Trianthema portulacastrum, 100mg/kg per orally.

All the drugs were given one hour prior to the sub plantar injection of inflammation inducing agent carrageenin 0.05 ml 1% in the right hind paw.

The right hind paw volume was measured by using mercury plethysmograph, immediately after the sub plantar injection of carrageenin (zero hour volume), and also at the end of 4 hours. The difference between the zero hour paw edema volume and the paw volume after 4 hours indicated the actual edema.

Thus, the mean paw edema volume in animals treated with drugs group wise was compared with that in control group and the anti-inflammatory activity of the drugs was assessed by the formula. Percent of (inhibition of edema) anti-inflammatory activity.

$=100[1-V_t/V_c]$  where  $V_t$  is the mean volume of paw edema in drug treated group, and  $V_c$  is the mean volume of paw edema in control group.

**Formalin induced peritonitis Model:** In this model also the rats were subdivided into three groups of six rats each.

Here again 2% gum acacia acted as control and 20mg/kg of indomethacin as standard and 100mg/kg of Trianthema portulacastrum as test drug. All drugs were given orally with gum acacia as suspending agent, one hour prior to intraperitoneal injection of 1ml of 1% formalin. Subsequently, the animals were sacrificed at the end of 4 hours after injection of formalin. Abdominal cavity of all the rats were opened and the exudates were collected and the volume of exudates was measured. The same formula was used as in the carrageenin method in order to calculate the percent of anti-inflammatory activity.

**STATISTICAL ANALYSIS:** All the data obtained were tabulated as mean and standard error of mean, the data were analysed using student's t test.

**RESULTS:** There was significant reduction in the amount of rat paw volume in carrageenin model, i.e. the percent of inhibition of edema formation was significantly higher as compared to control group, and the amount of reduction in the exudates in formalin induced peritonitis model were also significant i.e. the percent of inhibition of exudates formation was statistically significant as compared to control group with Trianthema portulacastrum, p value being <0.05 in both models.

**DISCUSSION:** Acute inflammation is the immediate and early response to an injurious agent. It is characterised by vasodilation, exudation of plasma and emigration of leukocytes. All these effects of inflammation are mainly mediated by prostaglandins, leukotrienes and histamine. The anti-inflammatory activity of Trianthema portulacastrum may be attributed to the fact that it contains

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flavonoids.<sup>7</sup> and flavonoids possess significant anti-inflammatory activity.<sup>8,9</sup> These flavonoids inhibit both the proliferative and exudative phases of inflammation. They inhibit the cyclooxygenase and lipoxygenase enzymes there by inhibiting the synthesis of prostaglandins and leukotrienes the main mediators of inflammation.<sup>10</sup>

The models used in our experiments are the most feasible and effective models of acute inflammation. The plant *Trianthema portulacastrum* showed significant anti-inflammatory activity in both the models.

**CONCLUSION:** With our study we conclude that *Trianthema portulacastrum* has got significant anti-inflammatory activity, so it may well act as an adjuvant to the currently used anti-inflammatory drugs.

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| Groups                           | Mean paw volume edema (cms)±SEM | Percent inhibition |
|----------------------------------|---------------------------------|--------------------|
| Control                          | 3.57±0.24                       | –                  |
| Indomethacin                     | 1.55±0.20                       | 56.58%*            |
| <i>Trianthema portulacastrum</i> | 2.17±0.16                       | 39.22%*            |

Table 1: Carraageenin induced hind paw edema model

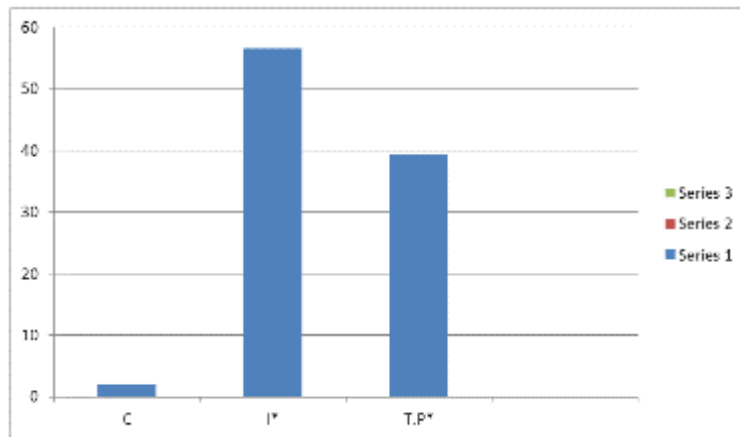
\*indicates p value p<0.05 i.e significant.

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| Groups                    | Mean peritoneal exudates volume (ml)±SEM | Percent inhibition |
|---------------------------|--|--------------------|
| Control                   | 2.37±0.25                                | –                  |
| Indomethacin              | 1.17±0.13                                | 50.63%*            |
| Trianthema portulacastrum | 1.53±0.20                                | 35.44%*            |

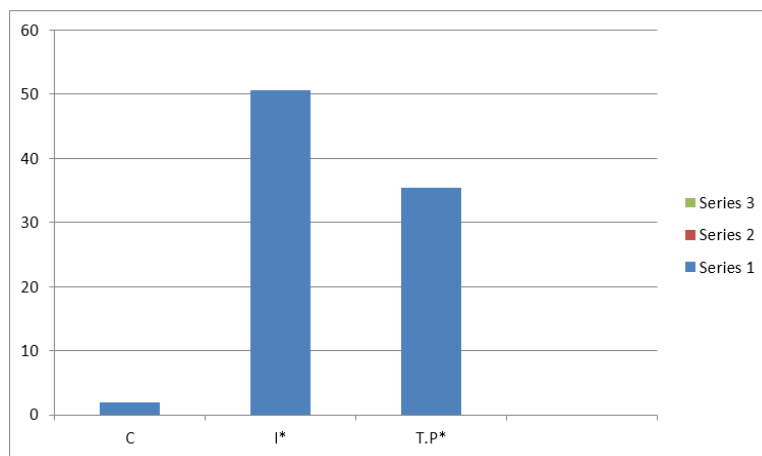
Table 2: Formalin induced peritonitis model

\*indicates significant p value  $p < 0.05$ .



**Fig. 1: Bar diagram showing the anti-inflammatory activity of indomethacin and Trianthema portulacastrum in carrageenin induced rat paw edema**

Y-axis indicates the percent of inhibition,  
 c- Control, i – indomethacin T.P- Trianthema portulacastrum,  
 \*indicates p value  $< 0.05$ .



**Fig. 2: Showing the anti-inflammatory activity of indomethacin and Trianthema portulacastrum in Formalin induced peritonitis**

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Y-axis indicates the percent of inhibition,  
c-control, I-Indomethacin, T.P-Trianthema portulacastrum.

\*Indicates significant p value of  $p < 0.05$ .

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