

**ANALGESIC ACTIVITY OF ETHANOLIC EXTRACT OF THE PLANT TRIANTHEMA PORTULACASTRUM IN EXPERIMENTAL MODELS**Umesh G. Wari<sup>1</sup>**HOW TO CITE THIS ARTICLE:**

Umesh G. Wari. "Analgesic Activity of Ethanolic Extract of the Plant Trianthema Portulacastrum in Experimental Models". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 34, April 27; Page: 5867-5871, DOI: 10.14260/jemds/2015/858

**ABSTRACT: BACKGROUND:** Trianthema portulacastrum has got many medicinal values and is being used in Ayurveda since a long time for these properties. So the current study was undertaken to evaluate the analgesic effects of this plant. **MATERIALS AND METHODS:** Wistar albino rats were treated with whole plant ethanolic extract of trianthema portulacastrum 100 mg/kg orally with 2% gum acacia, as suspending agent and indomethacin 20mg/kg as standard. And the effects were observed in experimental models of analgesic activity viz, acetic acid induced writhing and formalin induced paw licking test. **RESULTS:** Our study demonstrated trianthema portulacastrum reduced the number writhings in acetic acid induced writhing test and duration of paw licking in formalin induced paw licking test significantly. **CONCLUSION:** Trianthema portulacastrum has got significant analgesic activity. It may as well act as an adjuvant to the currently available analgesic drugs.

**KEYWORDS:** Pain, trianthema portulacastrum, indomethacin, analgesia, formalin, acetic acid.

**INTRODUCTION:** Trianthema portulacastrum also known as bishakhpara grows all over India. It is used in Ayurveda since centuries for its medicinal values.<sup>1</sup> It is a commonly used vegetable in many parts of India.

It contains many macro and micronutrients like fiber, protein, vitamins, and minerals like iron, phosphorus, and potassium.<sup>2</sup> Its roots are used as cathartics its leaves are useful in treating edema and dropsy. It is also used as anti helminthic.<sup>3,4</sup> So we took up this study to evaluate the analgesic activity of this plant.

**MATERIALS AND METHODS:** Whole plant ethanolic extract of trianthema portulacastrum in dose of 100mg/kg, indomethacin<sup>5</sup> 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 200 gms which were inbred in the central animal house were used for the experiment. The study was done after getting the clearance of institutional animal ethical committee.

All the rats were allowed food and water ad libitum both being withdrawn just prior to experiment.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

**Acetic Acid Induced Writhing Test:** In this model the rats were divided into three groups of six rats each, one acted as control which was treated with gum acacia 2% orally, another group received the

## ORIGINAL ARTICLE

---

standard drug indomethacin in the dose of 20 mg/kg per orally, the remaining group received the test compound trianthea portulacastrum, 100 mg /kg orally.

All the drugs were given one hour prior to the intra peritoneal injection of pain inducing agent acetic acid 0.6% (w/v), in the dose of 10 ml/kg body weight.<sup>6</sup>

The resulting pain was inferred from the writhing movements of the rats. Which were monitored at intervals of five minutes, for upto one hour for each rat and the cumulative total of writhings for one hour were taken into account. Analgesic activity was calculated on the basis of percentage of inhibition of writhing movements in animals, which was calculated as follows,

% of writhing protection =  $100 - [(w_t/w_c) \times 100]$ , where  $w_t$  is the mean cumulative number of writhings in drug treated group, and  $w_c$  is the mean cumulative number of writhings in control group.

Formalin induced paw licking test: In this model also the rats were divided 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 Trianthea portulacastrum as test drug. All drugs were given orally with gum acacia as suspending agent, one hour prior to the administration of 0.1 ml of 4% formalin into the plantar surface of left hind paw of rats subcutaneously. The time spent by rats in licking the injected paw as soon as the injection was given (Early phase, 0-5 minutes post injection) and in the late phase (20-30 minutes post injection) was recorded. The mean time spent on licking the paw by each group was determined.

**Statistical Analysis:** All the data obtained were tabled as mean and standard error of mean, the data were analysed using students t test.

**RESULTS:** Acetic acid induced writhing test.

In this model there was significant reduction in cumulative number of writhings i. e., the percent of protection against writhing was statistically significant in trianthea portulacastrum treated group as compared to control group, with p value being <0.005.

**Formalin Induced Paw Licking Test:** In this model also trianthea portulacastrum reduced the mean duration of paw licking response in early and late phases significantly as compared to control group with p value being <0.005.

**DISCUSSION:** Algesia or pain is an ill-defined, unpleasant bodily sensation, evoked by an external or internal stimulus. Prostaglandins induce hyperalgesia by affecting the transducing property of free nerve endings so that threshold of response to stimulus is lowered.<sup>7</sup> So a drug that prevents the synthesis of prostaglandins will be effective as an analgesic.

The trianthea portulacastrum is known to contain flavinoids,<sup>8</sup> and flavinoids inhibit the synthesis of prostaglandins by inhibiting the cyclooxygenase enzyme and hence they have got analgesic property.<sup>9</sup> The analgesic activity of trianthea portulacastrum which was demonstrated in our study may be explained by above mentioned facts.

**CONCLUSION:** In total the conclusion of our study is that trianthea portulacastrum has got significant analgesic activity. It may become a good addition to the currently available group of analgesics.

## REFERENCES:

1. Kirtikar K R, Bassu B D, Indian medicinal plants; Lalit mohan basu; alhabad. India, 1975, vol. 2, pp 230-236.
2. Khan N, Sultana A, Tahir N, Nutritional composition. Vitamins, minerals, and toxic heavy metal analysis of trianthea portulacastrum; pak afr J, Biotechnol, 2013, 12, 6074-6085.
3. Fazal U, Razzack M, A hand book of common remedies in unani medicine; central council of research in unani medicine, new delhi, India, 1978, ppp 105-108.
4. Khare C P, Indian medicinal plants, an illustrated dictionary; springer- verly, germany, 2006, pp 180-186.
5. Tripathi K D, in Essentials of medical pharmacology, jaypee publications, 7<sup>th</sup> edition, 2013, pp 192- 209.
6. Somchit MN, Bustaman AA, Antipyretic and analgesic activity of zingiber zerumbet. Int J Pharmacol, 2005; 1; 277-280.
7. Sharma HL, Sharma KK, In Principles of pharmacology, Paras publications, 2<sup>nd</sup> edition, 2011, pp 367-384.
8. Verma S C, Phytochemicalsstudies on leaves of Trianthea portulacastrum; Biol S (1) pp 67-73.
9. Ryski M, Duriasz R, The analgesic action of flavinoids in hot plate test; Acta physiol pol, 1979, 37 (3) pp385-388.

**Table 1:** Showing mean number of writhings and mean percentage of protection in acetic acid induced writhings.

Groups	No. of Writhings	% of Protection
Control	91.5±15.14	-
Indomethacin	29.80±4.6	65.94±3.2
Trianthea portulacastrum	34.35±5.7*	60.27±2.5*

Table 1

\*indicates significant p value  $p < 0.005$ .

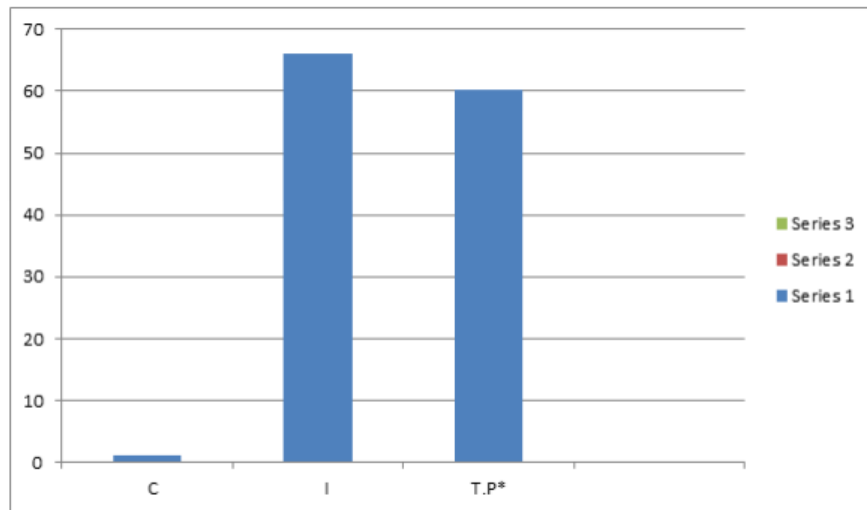
Groups	Early phase	Late Phase
Control	80.60±8.5	65.78±2.45
Indomethacin	35.77±4.2	32.46±3.4
Trianthea portulacastrum	40.68±4.5*	36.58±2.8*

Table 2: Showing effect of trianthea portulacastrum on formalin induced paw licking test in albino rats

\*indicates significant p value  $p < 0.005$ .

## ORIGINAL ARTICLE

**FIGURE 1:** Showing percentage of protection against acetic acid induced writhings in albino rats.



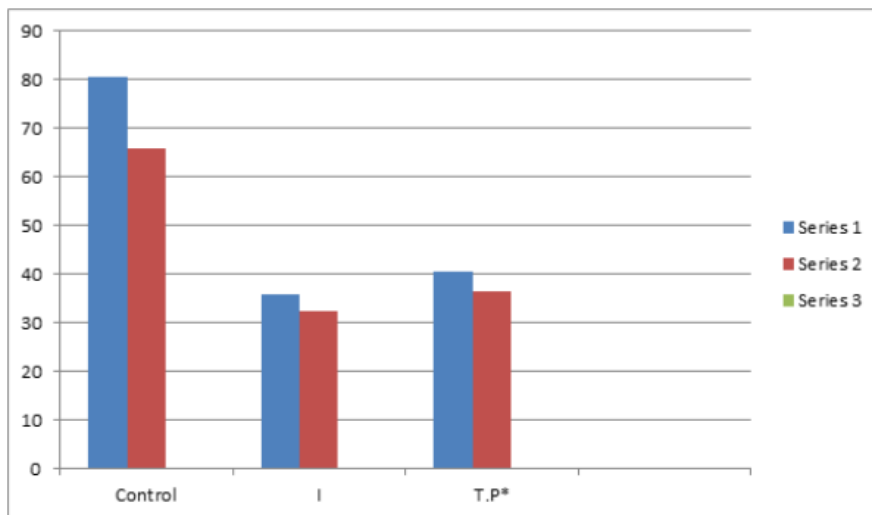
**Fig. 1**

C-Control, I-indomethacin, T. P- Trianthema portulacastrum.

\*indicates significant p value with  $p < 0.005$ .

Y axis indicates the percentage of protection.

**FIGURE 2:** Showing the effect of trianthema portulacastrum in formalin induced paw licking test



**Fig. 2**

I -Indomethacin, T. P- Trianthema portulacastrum.

Y axis indicates Early and late phase paw licking durations in seconds.

\*indicates significant p value with  $p < 0.005$ .

## ORIGINAL ARTICLE

---

**AUTHORS:**

1. Umesh G. Wari

**PARTICULARS OF CONTRIBUTORS:**

1. Associate Professor, Department of Pharmacology, VIMS, Bellary.

**FINANCIAL OR OTHER**

**COMPETING INTERESTS:** None

**NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:**

Dr. Umesh G. Wari,  
Associate Professor,  
Department of Pharmacology,  
VIMS, Bellary-583104.  
E-mail: umeshwaribly@rediffmail.com

Date of Submission: 03/04/2015.  
Date of Peer Review: 04/04/2015.  
Date of Acceptance: 15/04/2015.  
Date of Publishing: 25/04/2015.