

ANALGESIC ACTIVITY OF *MOLLUGO PENTAPHYLLA* LINN. BY TAIL IMMERSION METHODJENA PRABHAT KUMAR<sup>\*1</sup> AND NAYAK BHABANI SHANKAR<sup>2</sup>

*Mollugo pentaphylla* is a commonly used plant in the treatment of skin allergic condition, diabetes etc. This plant found in the tribal area of Salipur used traditionally by the local people for various diseases like analgesic, antidiabetic etc. Analgesic is a state of reduced awareness to pain. The present study is an attempt to explore the analgesic activity of ethanol, ethyl acetate and n-butanol extract of whole part of this plant. The analgesic activity of above extracts was evaluated by using tail immersion method in Swiss albino mice. The all extracts were able to reduce pain and ethyl acetate extract of *Mollugo pentaphylla* was found to have good analgesic activity in comparison to other extracts.

**Keywords :** *Mollugo pentaphylla*, Analgesics, Tail immersion method, Flick response, Thermal noxious stimuli, Neurotransmitters.

## INTRODUCTION

*Mollugo pentaphylla* Linn. named Pitta saga (Oriya) is a perennial herb found throughout India, also cultivated in some part of Orissa. Roots are creaper and adventitious, leaves are trifoliate small oval shape; flowers are small pinkish color, pentameric and bisexual. The urban people used this plant medicinally in paste form orally and externally for treatment of skin allergic condition, antimicrobials etc.<sup>1-3</sup>

Analgesics are defined as the substances which decreases pain sensation by increasing pain threshold to external stimuli. Noxious pain stimuli can be developed by thermal, chemicals and physical pressure.<sup>4</sup> The present study is an attempt to evaluate the analgesic activity of *Mollugo pentaphylla* Linn.

## MATERIALS AND METHODS

## Materials

Disposable syringe, heating mantle, stop watch, mice feeding needle, pentazocin, carboxy methyl cellulose were supplied by the department of Pharmacology and Soxhlet extractor was supplied by dept. of Pharmacognosy, Jeypore College of Pharmacy, Rondapalli, Jeypore. All other chemicals and reagents were procured from authorized suppliers and were of analytical grades. The plant material *Mollugo pentaphylla* whole part were collected from local area of Salipur and authenticated by Botanical Survey of India, Bhubaneswar, Orissa.

Preparation of extract of *Mollugo pentaphylla*

The plant was taken and air dried in shade for ten days. Then whole dried plants are made coarse powder. Now the extraction was occurred by the soxhlet apparatus using the ethanol as a solvent. From the ethanolic extract the successive fractions like ethyl acetate and n-butanol were

made by sub fraction method in a separating funnel. Then the extracts were concentrated by putting the extract on water bath or by distillation.

## Animals

Healthy albino mice of Swiss strain of either sex were used. They were housed in standard conditions of temperature (25±2 °C), 12 hours light per day cycle, relative humidity of 45-55 % in animal house of Jeypore College of Pharmacy. They were fed with standard pellets of food and water. Animals were kept and all operation on animals was done in aseptic condition.

## Drugs

*Mollugo pentaphylla* was tested in two doses in each group of experimental model (100 and 200 mg/Kg). Pentazocin was used as the standard drug in tail immersion model in a dose of 30 mg/Kg of body weight of mice.

## Experimental protocol

Animals were selected, weighed (25-30 g) and divided in to five groups (n=6), namely control, standard drug and three groups belonging to three different extract of *M. pentaphylla*. Approval for the research work was obtained by the institutional ethical committee of regd. No. HPI/07/60/IAEC/0013 of date. 07-05-2007.

## Method

The tail immersion method was used to evaluate the central mechanism of analgesic activity. Here the painful reactions in animals were produced by thermal stimulus that is by dipping the tip of the tail in hot water<sup>5</sup>.

Albino mice were divided in to four groups of six animals each. The animals were fasted for 16 hours with water ad libitum. The group-1 was served as solvent control which received the vehicle 0.5 % carboxy methyl cellulose (0.1 ml/10Kg) through oral route, the group-2 was served as

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TABLE- 1 Analgesic activity of total extracts of *M. Pentaphylla* by tail immersion response.

Treatment Dose (mg/Kg)		Tail flick latency in minutes. (X ± SEM)				
		30	60	90	120	180
CMC (0.5% w/v)	0.1 ml/10gm	3.43±0.10	2.68±0.19	2.68±0.12	2.75±0.17	2.62±0.10
Pentazocin	30	6.75±0.12	13.6±0.20	9.75±0.12	7.25±0.12	6.25±0.28
Ethanol extract	100	5.50±0.25	6.50±0.25	7.12±0.11	5.85±0.11	5.12±0.11
	200	6.37±0.40	7.37±0.21	8.87±0.11	7.12±0.11	5.37±0.12
Ethyl acetate extract	100	5.00±0.31	7.75±0.22	9.00±0.35	6.62±0.21	5.50±0.25
	200	7.00±0.18	9.25±0.22	10.5±0.25	9.00±0.18	6.50±0.23
n-butanol extract	100	5.25±0.41	6.37±0.32	6.87±0.27	6.25±0.12	5.50±0.20
	200	6.25±0.22	7.50±0.18	9.00±0.18	7.25±0.22	5.50±0.19

All values are expressed in mean ± standard error mean (n=6).

All data were found to be significant at 5% level of significance where p<0.05.

CMC represent carboxy methyl cellulose.

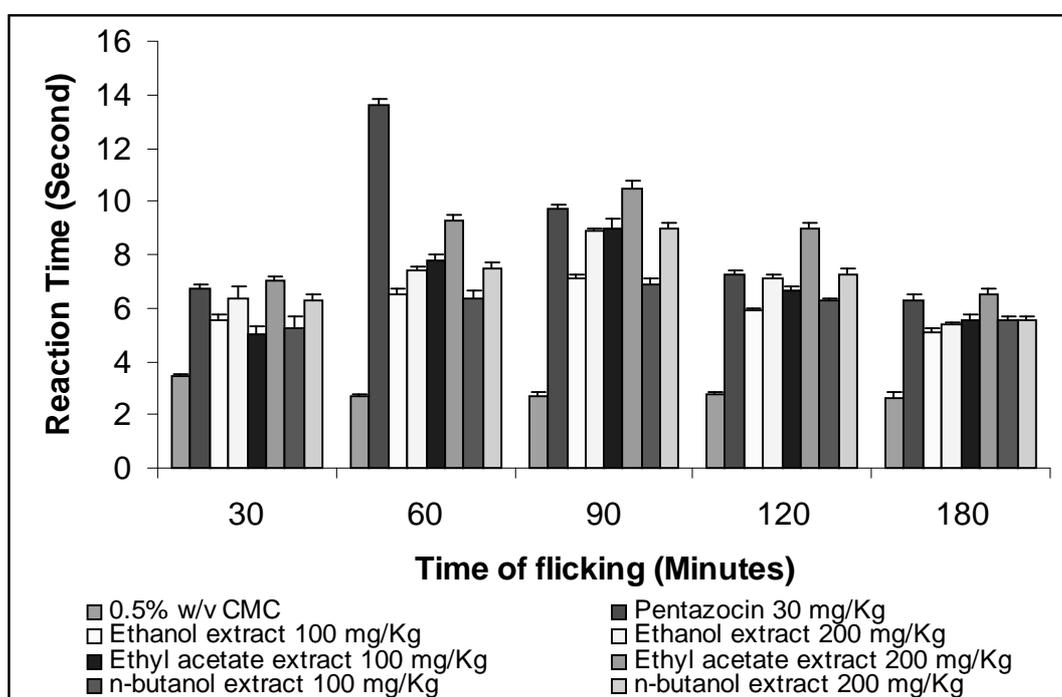


FIGURE 1. Comparative Analgesic activity of different extracts of *M. pentaphylla* in two concentrations. Each point represents mean ± standard error mean (n=6).

reference control which received Pentazocin (10 mg/1Kg) and group-3 to 5 were received in a dose of 100 and 200 mg/Kg each the extracts of ethanol, ethyl acetate and n-butanol.

After administration of above drug, the basal reaction time was measured after in a regular interval of 30 minutes, by immersing the tail tips of the mice (Last 1-2 cm) in hot water heated at temperature of temperature (55 ± 1) °C. The actual flick responses of mice i.e. time taken in second to withdraw it's from hot water source was calculated and result were compared with control group.

### Statistical analysis

All data were calculated statistically by standard error mean (n=6) and statistically significant were verified by applying one way ANOVA at 5 % level of significance .

### RESULT AND DISCUSSION

The extract produced a significant analgesia after 1.5 hours in the dose of 100 and 200 mg/Kg body weight (data are given in Table-1). These effects were well comparable with the standard drug used in this present study. It will be worth to mentioning that although different constituents

were extracted in different solvents as per polarity but ethyl acetate fraction is more effective as compared to other two solvent extracts and analgesic activity was found to be more in dose of 200 mg/Kg body weight. The activity showed by this extract is of considerable importance and justified its use in pain as suggested in the folklore medicines. By employing one way ANOVA, all data were found to be statistically significant at 5 % level of significance ( $p < 0.05$ ). Analgesic effect against thermal noxious stimuli may be elicited through opioid receptors or through modulation of several neurotransmitters involved in relevant phenomena. But the extent of activity shown by the crude extracts are less than that of the standard drug Pentazocin but many fold more than that of the control group, which justifies its activity. This can be clearly analyzed by the graphical representation given in Figure-1. It could be concluded that the plant *M. pentaphylla* is having analgesic activity and better results are obtained from extract of ethyl acetate. This further study needed to identify the chemical constituents present in extract of this herb that may elicit analgesic activity.

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