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## EVALUATION OF ANALGESIC ACTIVITY OF *MOMORDICA DIOICA* ROXB. WILLD FRUIT PULP

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### ABSTRACT

In the present study *Momordica dioica* Roxb willd (Cucurbitaceae) fruit pulp was successively extracted with petroleum ether, ethyl acetate and methanol. All extracts were vacuum dried to yield the respective extracts. All extracts were evaluated by non-narcotic models like acetic acid induced writhing syndrome test and narcotic models like hot plate for its analgesic activity in doses of 50 mg/kg and 100 mg/kg in mice body wt. All petroleum ether, ethyl acetate and methanol extracts gives significant exhibited analgesic activity in acetic acid induced writhing syndrome and hot plate when compared to the vehicle treated control group. But among them petroleum ether and methanol extract gives more significant exhibited analgesic activity than ethyl acetate extract.

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**INTRODUCTION:** Use of plant products is increasing in many segment of the population <sup>1</sup>. At present, thousands of plant metabolites are being successfully used for the treatment of variety of diseases. According to an estimate, 80% of the world's population relied upon plants for their medication <sup>2</sup>. The use of the medicinal plants is increasing in many countries where 35% of drugs contain natural products <sup>3</sup>. Presently drugs used for analgesic effect are synthetic in nature, prolonged use of which causes many side and toxic effects. Moreover, synthetic drugs are very expensive to develop. It is therefore essential that efforts should be made to introduce new medicinal plants to develop cheaper drugs.

*Momordica dioica* is a pereennial dioiceous climber found throughout India <sup>4</sup>. *Momordica dioica* Roxb. belongs to the family Cucurbitaceae <sup>5</sup>. The fruits pulp <sup>[6]</sup> and root <sup>[7]</sup> used in the treatment of analgesic. There is an insufficient quantity of data about the pharmacological activities of *Momordica dioica*, which prompted us to carry out this pharmacological evaluation of *Momordica dioica* fruit pulp extracts to verify the medicinal properties. In the present study petroleum ether, ethyl acetate and methanol of *Momordica dioica* fruit pulp was evaluated for its analgesic activities by non-narcotic models like acetic acid induced writhing syndrome test and narcotic models like hot plate.

## **MATERIALS & METHODS:**

**Plant Material:** Fruit of *Momordica dioica* were collected from Therla, Ta. Patoda, Beed district of Maharashtra, India in September 2009 and authenticated by P. G. Diwakar, Botanical Survey of India, Pune, where a sample specimen (voucher number: RAMAM1) No. BSI/WRC/Tech/2009/593 has been deposited.

**Extraction:** Shade dried, cleaned from extraneous materials, mechanically grinded and coarsely powdered fruit pulp of *Momordica dioica* was subjected to successive solvent extraction in Soxhlet extractor using petroleum ether, ethyl acetate, and methanol as solvent and the marc left was refluxed with water. All the extracts were vacuum dried to produce petroleum ether (1.5%), Ethyl acetate (2.6%), Methanol (18%) and Aqueous (4.67%) extracts respectively.

**Animals:** Albino mice (Swiss strain) weighing 25-30gm either sex were obtained from the Serum lab, Pune. The animals were maintained at room temperature of  $25\pm 2^{\circ}\text{C}$  with relative humidity of  $75\pm 5\%$  under 12 hours dark and light cycle. The animals maintained under standard husbandry conditions and had free access to diet and water. The animals were allowed to acclimatize to the environment for 7 days prior to the experimental session. The animals were divided into different groups each consist of six animals were fasted overnight prior to the experiments. The ethical committee of the institute approved the protocol of the study.

**Drugs and Chemicals:** The following drugs and chemicals were used. Drugs: Acetic acid (SD fine chemicals Limited, Mumbai), Paracetamol (Glaxo smith kine Pharma Ltd., Mumbai), Pentazocine (Pure Pharma Ltd., Mumbai) purchased from commercial source. Chemicals: petroleum ether ( $60-80^{\circ}\text{C}$ ) (RFCL Ltd, India), ethyl acetate (RFCL Ltd, India), methanol (MERCK Ltd, India) and DMSO (Research Lab Industries, India).

**Analgesic Activity:** Two standard methods viz. acetic acid induced Writhing reflex and hot plate methods were employed to determine the analgesic activity.

**Acetic acid induced writhing-reflex method in mice <sup>8</sup>:** The analgesic activity was determined by

acetic acid induced writhing method using six albino mice (25-30gm) of either sex selected by random sampling technique. Standard drug Paracetamol (50mg/kg) and the extracts (50mg/kg and 100mg/kg) were given intraperitoneally 30 minutes prior to the administration of the writhing agent (0.6%v/v aqueous acetic acid, 10ml/kg). The number of writhings produce in the animal was observed for 30 minutes. The number of writhing and stretching was recorded and compared with the Control drug. The percent was calculated using the following ratio:

% of protection = (Control mean- treated mean) X 100/Control mean.

The analgesic activity data are presented in **table 1**.

**TABLE 1: ANALGESIC ACTIVITY (WRITHING REFLEX METHOD) OF *MOMORDICA DIOICA* FRUIT PULP EXTRACTS IN MICE**

Treatment	Dose (mg/kg)	Writhing $\pm$ SEM	% Protection
Control	---	26.83 $\pm$ 0.9458	---
Standard	50	8 $\pm$ 0.2582	70.18
Petroleum ether	50	16.167 $\pm$ 0.4014**	39.74
	100	11.33 $\pm$ 0.6146**	62.01
Ethyl acetate	50	24 $\pm$ 0.2582**	10.55
	100	20.83 $\pm$ 0.9458**	30.17
Methanol	50	25.83 $\pm$ 0.7923	03.72
	100	24.33 $\pm$ 0.4214**	18.43

Data are expressed as Mean  $\pm$  S.E.M, n = 6 in each group, Statistical analysis done by one way ANOVA followed by Dunnett's test. \*\*P<0.01 compared to control group

**TABLE 2: ANALGESIC ACTIVITY (HOT PLATE METHOD) OF *MOMORDICA DIOICA* FRUIT PULP EXTRACTS IN MICE**

Treatment	Dose (mg/kg)	Reaction intervals (Seconds) at time (min)					
		30	60	90	120	150	180
Control	---	6.75 $\pm$ 0.2500	5.75 $\pm$ 0.2500	5.75 $\pm$ 0.7500	4.5 $\pm$ 0.9574	3.5 $\pm$ 0.655	3.5 $\pm$ 0.6455
Standard	50	7 $\pm$ 0.4082	9 $\pm$ 0.707*	9.75 $\pm$ 0.47**	6.5 $\pm$ 0.6455	3 $\pm$ 0.000	3 $\pm$ 0.000
Petroleum ether	50	8 $\pm$ 0.9129	8.5 $\pm$ 1.190	10.75 $\pm$ 0.63**	8.5 $\pm$ 1.014*	5 $\pm$ 0.7071	4.75 $\pm$ 0.4787
	100	7.25 $\pm$ 0.7500	8.25 $\pm$ 0.7500	10 $\pm$ 1.291*	8.75 $\pm$ 0.47**	3.75 $\pm$ 0.7500	3.75 $\pm$ 0.7500
Ethyl acetate	50	6.75 $\pm$ 0.4782	8 $\pm$ 0.4082	8.75 $\pm$ 0.9465	8.5 $\pm$ 0.866*	5.75 $\pm$ 0.2500	5.75 $\pm$ 0.2500
	100	6.25 $\pm$ 0.4782	6.75 $\pm$ 0.7500	9 $\pm$ 1.414	9 $\pm$ 0.70**	4.75 $\pm$ 0.4787	4.75 $\pm$ 0.4787
Methanol	50	7 $\pm$ 0.4082	10.25 $\pm$ 0.25*	10 $\pm$ 0.41**	6.5 $\pm$ 0.500	4.5 $\pm$ 1.041	4.25 $\pm$ 0.8539
	100	9 $\pm$ 1.800	10.5 $\pm$ 0.500*	8 $\pm$ 1.225	3.5 $\pm$ 0.2827	4 $\pm$ 1.414	3.5 $\pm$ 1.190

Data are expressed as Mean  $\pm$  S.E.M, n = 6 in each group, Statistical analysis done by one way ANOVA followed by Dunnett's test. \*P<0.05, \*\* P<0.01 compared to control group

## DISCUSSION:

**Acetic acid induced writhing-reflex method in mice:** At doses 50 and 100mg/kg i.p. of *Momordica dioica* fruit pulp petroleum ether, ethyl acetate and methanol extracts showed reduction in number of writhing. It was observed

that petroleum ether and ethyl acetate more significant analgesic activity, when compare to methanol. The effect of *Momordica dioica* fruit pulp extracts showed dose dependent reduction in the number of writhing as compared to control drug which was highly significant (P<0.01).

**Hot plate method in mice:** *Momordica dioica* fruit pulp extracts pretreatment increased the response latency in the hot plate test which was significant. The control drug increased the response latencies at various time intervals. The effect of *Momordica dioica* fruit pulp extracts was dose as well as time dependent. Amongst all the doses used, petroleum ether extract was most effective at 50 and 100mg/kg at 90 and 120 minutes, as well as methanol extract at 50mg/kg at 60 and 90 minutes comparable as the control drug which was highly significant ( $P < 0.05$ ,  $P < 0.01$ ).

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#### REFERENCES:

1. Eisenberg DM, Kessler RC and Foster C: Unconventional Medicine in the United States:

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- Prevalence, Costs and Patterns of Use. N Eng J Med 1993; 328:246-252.
2. Akerele O: Nature's Medicinal Bounty: Don't Throw It Away. World Health Forum 1993; 390-395.
3. Sofowora A: Medicinal Plants and Traditional Medicine. In: Africa, John Willey Sons Ltd. NY, 1982: 6.
4. Shastri BN: The Wealth of India - Raw Materials. CSIR, New Delhi, 1962: 408.
5. The Wealth of India. Publication and Information Directorate, CSIR, New Delhi, Vol. 6, 1962: 411.
6. Ilango K, Maharajan G and Narsimhan S: Analgesic and Anti-inflammatory activity of *Momordica dioica* fruits pulp. Natural Product Sciences 2003; 9(4): 210-112.
7. Vaidya VP and Shreedhara CS: Medicinal values of the root of *Momordica dioica* (Cucurbitaceae). Proceedings of First National Interactive Meet on Medicinal & Aromatic Plants, CIMAP, Lucknow, UP, India 2003; 278-281.
8. Witkin LB, Heubner CF, O'Keete E, Spitalitta P and Plummer AJ: J. Pharmacol. Exp. Ther. 1961; 133:400.