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Research Article

To evaluate the analgesic activity of leaves of *Musa sapientum linn.*

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ABSTRACT

Musa sapientum linn. (Musaceae) commonly known as Banana, is extensively cultivated throughout India .By literature survey different parts of *Musa sapientum* have been studied for antiestrogenic, hypolipidemic, antihypertensive, wound healing, antacid, hypoglycemic, diuretic, anti ulcerogenic activities. The pill and stem extract of banana was found to have analgesic property. But, there is no evidence in literature for analgesic activity of leaves of *Musa sapientum linn*. Hence the present investigation was undertaken to study analgesic activity of aqueous extract (AEMS) and ethanolic extract (EEMS) of leaves of *Musa sapientum linn*. using hot plate method. AEMS and EEMS (400mg/kg and 400mg/kg, i.p.) significantly increased reaction time as compared to vehicle treated group. Maximum analgesic effect was observed at 2 hrs interval for 400mg/kg and 400 mg/kg i.p. (P=0.001).

Key words: *Musa sapientum Linn.*, Analgesic activity, Hot plate method, (AEMS), (EEMS), Pentazocin

INTRODUCTION

Musa sapientum linn (Musaceae) Commonly called 'kala' (English Banana) is extensively cultivated throughout India. It is one of the most popular fruit crop in India [(1)].In India dried fruits, flowers and roots is used orally for diabetes. The roots are used as anthelmentic, aphrodisiac and laxative. The fresh fruit is used for peptic and duodenal ulcers[(2,3)].Banana contains different amino acids like threonine, tryptamine ,tryptophan, flavonoids and steroids [(3)].Till date different parts of *Musa sapientum linn.* have been studied for antiulcerogenic[(4-6)],hypoglycemic[(7-8)], hypolipidemic[(9)], antimicrobial[(10)], antihypertensive[(11)].The pill and stem extract of banana was found to have analgesic property[(12-13)].But there is no evidence in literature for analgesic activity of leaves of *Musa sapientum* .Hence ,the present study was undertaken to study analgesic activity of leaves of *Musa sapientum linn.* using hot plate method.

MATERIALS AND METHODS

Plant material: The fresh banana leaves were collected from local farmers in the Rohilkhand region and identified correctly by Dr. Alok Khare, Botany Department, Bareilly College, Bareilly 243001, (UP) India. (*ref*-Bareilly College Herbarium, BHRK-592).The leaves were dried in shed and powdered using laboratory grinder.

Animals: Albino mice weighing 20-25gm were used. The animals were allowed to acclimatize to laboratory condition for not less than 10 days after their arrival .The animals were housed in groups under standard light/dark cycle with food and water provided *ad libitum.* Food was withdrawn six hour prior to drug administration till completion of the experiment on the day. All experiments were conducted during the light period of 12/12hours light /dark cycles.

Preparation of extract: For aqueous extract (AEMS), 500gm of fresh leaves was macerated with1000 ml of distilled water for three days with intermittent stirring, filtered and concentrated to a constant weight. For ethanol extract (EEMS), 500gm of dried and powdered stem was subjected to Soxhlet's extraction with ethanol for about 48 hrs. The extract was filtered and concentrated in vacuum under reduced pressure and dried in desiccators.

Experiment Method: Hot plate method: Male Swiss albino mice weighing 25-30gm were divided into six groups each containing five animals. The hot plate was maintained at 55^0 to 56^0C.The animals are placed on the hot plate and the time until either licking or jumping occurs is recorded by a stop watch. The latency was recorded at 0, 1, 2 and 3 hrs intervals after vehicle, standard and test drug administration .The test was terminated at 15sec. to prevent tissue damage.

Statistical analysis: All results are expressed as mean ± SEM. The data was analyzed statistically using student't' Test.

RESULTAND DISCUSSION

The aqueous and ethanolic extracts of *Musa sapientum* administrated intraperitoneally in a dose of 400mg/kg and 400mg/kg in mice has shown significant analgesic activity in hot plate method as supported by increase in reaction time at 0, 1, 2 and 3hrs intervals (P=0.001). The increase in reaction time is dose dependent. Both the doses of the extract have shown significant activity (P=0.001). Maximum analgesic effect was observed at 2hrs interval. Table 1 significant analgesic activity showed by AEMS and EEMS.

Pain is two types, peripheral or neurogenic pain, may involve the following pathological states: peripheral nociceptive afferent neurons which are activated by

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Table 1: Effect of Extracts of *Musa sapientum linn* on Thermic Stimulus Induced Pain (Hot Plate test) in mice

Treatment	Dose (mg/Kg)	Reaction Time in second (of time Hour's)			
		0	1	2	3
Control (5% gum acacia)	5ml/Kg	4.65 ± 0.18	5.22 ± 0.08	5.26 ± 0.07	4.48 ± 0.08
Pentazocin	5mg/Kg	4.75 ± 0.09	9.31 ± 0.07	11.66 ± 0.16	8.22 ±0.03
Aqueous Extracts	400mg/Kg	5.22 ± 0.30∗	6.59 ± 0.49∗	9.45 ± 0.30∗	6.55 ±0.10∗
Alcoholic Extracts	400mg/Kg	4.43 ± 0.07∗	6.16 ± 0.15∗	9.17 ± 0.11∗	7.23 ± 0.24∗

All Values are as Mean ± SEM

∗ P < 0.001

noxious stimuli and central mechanism which is activated by afferent inputs pain sensation [(14)] .The central acting analgesics generally evaluated the pain threshold of mice towards heat. Hot plate method is most sensitive methods to centrally acting analgesics. The AEMS and EEMS increased the reaction time in hot plate indicating that AEMS and EEMS are centrally acting analgesics. Thus, from the above study it can be concluded that aqueous and ethanol extract of leaves of *Musa sapientum linn.* posses potential analgesic activity which can be explored further.

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