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To study analgesic activity of stem of *Musa sapientum* linn.

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ABSTRACT

Musa sapientum Linn (Musaceae) commonly called 'Kela' in Hindi (English: Banana) is extensively cultivated throughout India. Till date different parts of *Musa sapientum* have been studied for anti ulcerogenic, hypoglycemic, hypolipidemic, antimicrobial, antihypertensive, wound healing, antacid, diuretic and antiestrogenic activities .The pill extract of banana was found to have analgesic property. But, there is no evidence in literature for analgesic activity of stem of Musa *sapientum*. Hence the present investigation was undertaken to study analgesic activity of aqueous (AMS) and ethanolic (EMS) extract of stem of *Musa sapientum* Linn. using hot plate method and tail immersion method. AMS and EMS (100mg/kg and 200mg/kg, i.p) significantly increased reaction time as compared to vehicle treated group. Maximum analgesic effect was observed at 30 min. interval for 100 mg/kg and 200 mg/kg, i.p. (P = 0.01). The present study indicates that AMS & EMS have central analgesic action.

Keywords: *Musa sapientum*, analgesic activity, hot plate method and tail immersion method.

INTRODUCTION

Musa sapientum (Musaceae) commonly called 'Kela' (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 anthelmimtic, 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 sterols.[3] Till date different parts of *Musa sapientum* have been studied for antiulcerogenic[4-6] hypoglycemic[7,8] hypolipidemic[9]antimicrobial[10]antihypertensive[11] wound healing ,antacid, diuretic and antiestrogenic activities[11] . The pill extract of banana was found to have analgesic property. [12] But, there is no evidence in literature for analgesic activity of stem of *Musa sapientum*. Hence the present investigation was undertaken to study analgesic activity of stem of *Musa sapientum* linn. using hot plate method and tail immersion method.

MATERIAL AND METHODS:

Plant material: The fresh banana stem were collected from local farmers in the Jalgaon region and identified correctly by Pharmacognosy Department of Indira College of Pharmacy, Tathawade, Pune-411033, India. The stem was dried in shed and powdered using laboratory grinder.

Animals: Albino mice weighing 20-25g 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 a 12/12 hours light/dark cycles.

Preparation of extract: For aqueous extract (AMS), 500 gm of fresh stem was macerated with 1000 ml of distilled water for three days with intermittent stirring, filtered and concentrated to a constant weight. For ethanol extract (EMS), 500 gm of dried and powdered stem was subjected to Soxhlet's extraction with ethanol for about 48 hours. The extract was filtered and concentrated in vacuum under reduced pressure and dried in desiccator.

Experimental Method:

1. Hot plate method: [13] Male Swiss albino mice weighing 25-30 gm were divided into six groups each containing five animals. The hot plate was maintained at 55° to 56 °C. 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 0,15,30,60 and 90 minute intervals after vehicle, standard and test drug administration. The test was terminated at 15 sec. to prevent tissue damage.

2. Tail immersion method: [13] Male Swiss albino mice weighing 25-30 gm were divided into six groups each containing five animals. The tail of the mouse was immersed to a constant level (3 cm) in a water bath maintained at 55 ± 0.5°. The time to flick the tail from water (reaction time) was recorded. A maximum immersion time of 30 sec. was maintained to prevent thermal injury to the animals. A significant increase in reaction time compared with control animals was considered a positive analgesic response

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

RESULT:

The aqueous (AMS) and ethanolic (EMS) extracts of *Musa sapientum*

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Table 1: Effect of AMS and EMS on reaction time using Hot plate method.

Treatment	Reaction time in second(mean ± SEM)				
	0 min	15min	30 min	60min	90min
Vehicle(5ml/kg)	2.78 ± 0.042	2.77 ± 0.0026	2.82 ± 0.0085	2.81 ± 0.011	2.30 ± 0.41
Pentazocine(10mg/kg)	2.62 ± 0.314	5.35 ± 0.034*	6.46 ±1.32 *	4.15 ± 0.60*	2.80 ± 0.23
AMS(100mg/kg)	2.65 ± 0.045	3.10 ± 0.0073*	4.14 ± 0.14*	3.48 ± 0.0073*	3.25 ± 0.11
AMS(200mg/kg)	2.60 ± 0.032	2.92 ± 0.20	5.12 ± 0.095*	4.41 ± 0.094*	3.27 ± 0.076
EMS(100mg/kg)	2.88 ± 0.030	3.11 ± 0.0097*	4.02 ± 0.010*	3.52 ± 0.0073*	2.91 ± 0.22
EMS(200mg/kg)	2.64 ± 0.16	3.22 ± 0.069	4.86 ± 0.029*	4.33 ± 0.050*	3.26 ± 0.028

*n = 5, * P = 0.01 Vs vehicle treated group, Student't' test*

Table 2: Effect of AMS and EMS on reaction time using tail immersion method.

Treatment	Reaction time in second(mean ± SEM)				
	0 min	15min	30 min	60min	90min
Vehicle(5ml/kg)	3.88 ± 0.27	4.28 ± 0.18	4.13 ± 0.13	4.44 ± 0.081	4.25 ± 0.054
Pentazocine(10mg/kg)	3.96 ± 0.31	5.44 ± 0.21 *	5.84 ± 0.41*	5.76 ± 0.22*	5.27 ± 0.02*
AMS(100mg/kg)	3.88 ± 0.27	4.33 ± 0.093	5.21 ± 0.23*	4.79 ± 0.25	4.13 ± 0.13
AMS(200mg/kg)	3.72 ± 0.22	3.70 ± 0.21	5.58 ± 0.068*	5.16 ± 0.29	4.18 ± 0.015
EMS(100mg/kg)	3.98 ±0.28	4.11 ± 0.26	5.27 ± 0.029*	5.09 ± 0.13	4.37 ± 0.10
EMS(200mg/kg)	3.40 ± 0.58	3.51 ± 0.59	5.65 ± 0.072*	5.14 ± 0.20	4.36 ± 0.22

*n = 5, * P = 0.01 Vs vehicle treated group, Student 't' test*

administered intraperitoneally in a dose of 100 and 200 mg/kg in mice has shown significant analgesic activity in hot plate method and tail immersion method as supported by increase in reaction time at 15, 30, 60 and 90 min. intervals (P = 0.01). The increase in reaction time is dose dependent. Both the doses of the extract have shown significant analgesic activity (P = 0.01). Maximum analgesic effect was observed at 30 min. interval. Table 1 and 2 depicts significant analgesic activity showed by AMS and EMS using hot plate method and tail immersion method.

DISCUSSION:

Pain is subjective experience, not always associated with nociception. Pain is distinguished as two types, peripheral or neurogenic pain, may involve the following pathological states: peripheral nociceptive afferent neurons which are activated by noxious stimuli and central mechanism which is activated by afferent inputs pain sensation.[14] The centrally acting analgesics generally elevate the pain threshold of mice towards heat. Hot plate and tail flick tests are most sensitive methods to centrally acting analgesics. The AMS & EMS increased the reaction time in hot plate and tail immersion test indicating that AMS & EMS are centrally acting analgesics. Thus, from the above study it can be concluded that aqueous and ethanol extract of stem of *Musa sapientum* Linn. posses' potential analgesic activity which can be explored further.

REFERENCES:

1. Bose TK, Fruits of India: Tropical and Subtropical, Naya Prakash ,Calcutta, 1985, 346.
2. Jain SR, Sharma SR, Hypoglycemic drugs of Indian indigenous origin, Planta Med , 15,1967, 439.
3. Ivan AR, Musa sapientum, In: Medicinal plants of the world, Humana Press In, Totowa. NJ, 2005,319.
4. Sanyal AK, Das PK, Sinha S, Sinha YK, Banana and gastric secretion, Journal of Pharmacy and Pharmacology, 13, 1961,318.
5. Goel RK, Sairam K, Anti-ulcer drugs from indigenous sources with emphasis on *Musa sapientum, Tamrabhasma, Asparagus racemosus* and *Zingiber Officinal*,. Indian Journal of Pharmacology, 34,2002, 100.
6. David AL, William NF, Graham PS, A natural flavonoid present in unripe plantain banana pulp (*Musa sapientum L. var. paradisiaca*) protects the gastric mucosa from aspirin-induced erosions, Journal of Ethnopharmacology, 65,1999,283.
7. Dhanabal SP, Sureshkumar M , Ramanathan M, Suresh B, Hypoglycemic effect of ethanolic extract of Musa sapientum on alloxan induced diabetes mellitus in rats and its relation with antioxidant potential, Journal of Herbal Pharmacotherapy, 5,2005,7-19.
8. Oke JM, Achife CJ, Adefisan OO, Hypoglycaemic activity of the alcoholic extract of *Musa sapientum, Nig*. J. Nat Prod. And Med, 3,1999,68.
9. Gomathy R, Vijayalekshmi NR, Kurup PA, Hypolipidemic principle of the inflorescence stalk of plantain (*Musa sapientum*),.Journal of Biosciences, 14,1989,301.
10. Mangathayaru K, Umeshankar G, Muralitharan G, Cordairayen E , Vasantha J,Antimicrobial activity of some indigenous plants, Ind. J pharm. Sciences, 66,2004,123.
11. Anonymus, The Wealth of India, Council of Scientific and Industrial Research, New Delhi, 2003,178.
12. Jain DL, Baheti AM, Ingale SP, Ingale PL, Parakh SR. Study of antacid and diuretic activity of ash and extracts of *Musa sapientum* L. fruit peel, Pharmacognosy magazine, 3,2007,116.
13. Vogel HG, Vogel WH, Drug discovery and evaluation-Pharmacological assays, 2nd ed, Springer Verlager Berlin Heidelberg ,New York,2002,.696-7,692,772.
14. Rang HP, Dale MM, Ritter JM , Moore PK, Pharmacology,5th ed, Churchill Livingstone, New Delhi, 2005.

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