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STUDY OF ANALGESIC ACTIVITY OF *Merremia emarginata* (BURM. F) HALLIER F.

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ABSTRACT

The ethanolic extract of the leaves of Merremia emarginata(Convolvulaceae) obtained by soxhlet extraction method was evaluated for analgesic action by acetic acid induced reflex method and tail immersion method in mice. The ethanolic extract in doses of 200mg/kg of Body weight were evaluated for central analgesic activity by acetic acid induced writhing and tail immersion model in mice respectively. The ethanolic extract of the leaves of Merremia emarginata significantly (P<0.01) reduced the writhing count at 200 mg/kg. In tail immersion model, the ethanolic extract of the leaves of Merremia emarginata increase the reaction time significantly (P<0.01) at 200 mg/kg. The acute toxicity studies was also carried out which did not show any toxic effect at the dose of 2g/kg.

KEYWORDS

Acetic acid-induced writhing test, analgesic activity, Merremia emarginata, tail immersion test.

INTRODUCTION

Pain is an unpleasant subjective experience that is the net effect of a complex interaction of the ascending and descending nervous systems involving biochemical, physiological, psychological, and neocortical processes (Chisholm-Burns et al. 2008). Pain is the most common symptom prompting patients to seek medical attention and is reported by more than 80% of individuals who visit their primary health care provider. Pain can affect all areas of a person's life including sleep, thought, emotion, and daily activities. Since there are no reliable objective markers for pain, the patients are the only ones to describe the intensity and quality of their pain[1]. Nature is the best source of chemical constituents. The plant Merremia emarginata (Convolvulaceae) Hallier f. belongs to family of Convolvulaceae. In India it is mainly found in Chennai, and some place of Andhra Pradesh. And it is known by various names in different regions viz., Mooshakarnee in Sanskrit, Indurkani in Bengal, Tolnnuatali in Telugu, Paerttaekirae in Tamil. The plant was therapeutically used asDE obstruent, diuretic, and for cough, headache, neuralgia and rheumatism. The present study was carried out to test the analgesic efficacy of the leaves extract of M. emarginata burm.F in mice. [2-5]

MATERIALS AND METHODS

Preparation of plant material

The fresh samples of Merremia emarginata (Burm. f.) Hallier was collected from Villianur area of Puducherry during the month of February 2011 with help of Dr.A.Muthuvel, R.S. M.P., D.H.S., D.S.M. The voucher specimen of the plant is deposited in the Department of Pharmaceutical Analysis, College of Pharmacy, Mother Theresa Post Graduate and Research Institute of Health Sciences, Puducherry for the future references [6].

Extraction procedure

The leaves were dried under shade and powdered by mechanical process. The powdered leaves were stored in airtight

container for further studies. The powdered material (40g) was extracted in a Soxhlet apparatus using solvent 80% aqueous ethyl alcohol by continuous hot percolation technique for about 72 hrs. Temperature was maintained on an electric heating mantel with a thermostat control. The extract was then concentrated to 3/4th of its original volume by distillation. The concentrated extract was then transferred to a china dish and evaporated on a thermostat controlled water bath till it formed a thick paste. This thick mass was vacuum dried in desiccator till it's free from moisture. The concentrated aqueous ethanolic extract is 7g.

Animals

The experiment was carried out on Swiss albino mice, weighing between 20-25gm.The animals were adapted to lab conditions for 7 days prior to the experiment free access to water. Number of mice in

Each group was five and divided into three groups.

1. Negative control (received normal saline 0.1ml/kg)
2.Positive control (Pethidine 30mg/kg, intraperitoneal route as standard analgesic agent).
3.Test control *(Merremia emarginata* 200mg/kg, Intraperitoneal).

Acute Toxicity Studies

Acute toxicity study was performed in accordance with OECD guidelines 425 [7] on mice. No adverse effect or toxicity was detected. This was conducted on mice to determine the minimum lethal dose of the drug. Swiss albino mice of either sex weighing between 20-25 g fasted overnight was used for the study. The test drug at the dose of 2g/ Kg was given. The animals were observed for 24 hrs. For symptoms like difficulty in breathing, sedation decreased motor activity etc. The animals did not show any above said symptoms or any other toxic effects. No mortality was observed for 3 days, so it was found to be safe dose. A stock solution of 40mg/ml of alcoholic extract of the drug was prepared with distilled water.

ANTINOCICEPTIVE ACTIVITY

Tail immersion method

Prior to analgesic experiments, the animals were screened for the sensitivity test by immersing the tail of the mice gently in hot water maintained at 50-60°C. The tail at which the animals withdraw its tail from hot water is taken as end point. The selected mice was divided in to 3 groups of 5 each. Normally mice withdraw its tail within 3-5 Sec. The cut off period of 15 second is observed to prevent damage to tail. The tail was immersed at 0, 5, 15, 30& 45 min after the administration of the test extract and standard. The aqueous ethanolic extract (200mg/kg,Intraperitoneal route) was given on experimental group; standard analgesic agent Pethidine(30mg/kg, intraperitoneal route) was taken as positive control. The results are tabulated in **Table 1**.

TABLE 1: Effect of ethanolic extract of *Merremia emarginata* on thermally induced pain in mice

Sl. No	Drug and dose(mg/kg)	Basal reaction time(sec)				
		0min	5min	15min	30min	45min
1	Normal saline(0.1ml/kg,i.p)	3±0.23	3±0.33	3±0.58	3±0.28	3±0.55
2	Pethidine(30mg/kg)	3±0.22	5±0.48	9±0.65	10±0.46	15±0.44
3	*Merremia emarginata (200mg/kg)*	3±0.12	4±0.45	6±0.77	8±0.76	9±0.49

Values are given as mean ± S E M, n =5, *P > 0.01, ** P > 0.001 using student's test

Acetic acid induced writhing-reflex method in mice [8]

The analgesic activity was determined by acetic acid induced writhing method using five albino mice (20-25gm) of either sex selected by random sampling technique. Standard drug Pethidine (30mg/kg, Intraperitoneal) and the extracts (200mg/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 writhing produced in the animal was observed for 30 minutes. The number of writhing and stretching was recorded and compared with the test drug. The percent was calculated using the following ratio: % of protection = Control mean-treated mean X 100/Control mean. The results are tabulated in **Table 2**.

TABLE 2: Effect of ethanolic extract of *Merremia emarginata* By acetic acid induced writhing method on mice

Sl.No	Treatment	Dose	writhing
1	Normal saline	(0.1ml/kg,i.p)	29
2	Ethyl acetate	(100mg/kg)	14.6±0.43
3	Standard(Pethidine)	(30mg/kg)	5.2±0.35
4	Test(*Merremia emarginata)*	*(200mg/kg)*	4.8±0.74

Data are expressed as Mean ± S.E.M, n = 5 in each group, Statistical analysis done by Dennett's test.
****P<0.01 compared to control group.**

RESULTS AND DISCUSSION

In analgesic studies, the extract showed significant analgesic activity at all tested dose levels. The analgesic studies revealed that the ethanolic extract of *Merremia emarginata* exhibited potent analgesic (central analgesic activity) effect against thermal noxious stimuli which was very comparable to standard drug Pethidine (30mg/kg, i.p.).The tested drug *M.emerginata* (200 mg/Kg, i.p) did not show any toxic effect at the dose of 2g/kg. Hence the drug was found to be safe to use.

CONCLUSION

From the above investigation, it is quite apparent that ethanolic extract of *Merremia emarginata* (BURM. F) Possess potent analgesic effect against different stimuli. This is evidenced by significant increase in the reaction time by stimuli in mice by acetic acid induced writhing and tail immersion methods.

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