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PHARMACOLOGICAL EVALUATION OF *TRAGIA PLUKENETII* R. SMITH LEAF EXTRACTS FOR ANTI-NOCICEPTIVE ACTIVITY BY USING TAIL FLICK METHOD

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ABSTRACT

To investigate the effects of *Tragia plukenetii R Smith* leaf extracts for analgesic activity using tail flick method. The preclinical evaluation of standardized benzene, chloroform, and methanolic extracts of the leaves of *Tragia plukenetii R.* smith was carried out for analgesic activity using tail flick method in swiss albino mice. The methanolic leaf extract of *Tragia plukenetii R. Smith* has shown significant analgesic activity when compared with all the other groups using tail flick method. The results conclusively demonstrate the efficacy of *Tragia plukenetii R. Smith* methanolic leaf extracts for analgesic activity.

KEYWORDS

Tragia plukenetii, Euphorbiaceae, Central analgesics, Anti-nociceptive and Tail flick method.

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INTRODUCTION

The whole plant of *Tragia plukenetii R. Smith* (Family: Euphorbiaceae) is a erect, sub erect or prostrate herb, sometimes annual, up to 90 cm long, rarely more and liansscent; indumentums sparse, mostly of painful stinging hairs, distributed throughout India from Punjab and lower Himalayas eastwards to Assam and Meghalaya, ascending up to an altitude of 750 meters and southwards to Kerala[1,2]. Analgesic models for studying drugs are conditions the effect cognitive processes rely on introduction of stimuli to induce an analgesics state within organism. The nature of this state, and the

interpretation of pain, is assessed by the response to the pain in the presence and absence of agents and more generally defined as an "enhancement of analgesic process". Based on the pain behavioral model studying the neurobiology of pain can be broadly classified into two types: exteroceptive (the pain for analgesic originating outside the body) or introceptive (the pain for analgesic originating inside the body).

Thus for measuring the analgesic many instruments came into existence such as randall-selitto-test, tail flick test, hot plate test. Most of the currently used paradigms for pain are hot plate method, randall-selitto-test, tail flick test[3-7]. The main aim of the present of the study is to investigate the effects of *Tragia plukenetii R. Smith* leaf extracts for analgesic activity using these introceptive stimuli model.

Analgesia is defined as a state of reduced awareness to pain without loss of consciousness and analgesics are substances which relives pain by acting in the CNS or peripheral mechanisms, without significantly altering consciousness. There two types of available analgesics:

1. Opioid (narcotic) analgesics: e.g., morphine, codeine, papaverine etc.
2. Non opioid (non narcotic) analgesics: e.g., Aspirin, Indomethacin, Ibuprofen Diclofenac, naproxen etc.

In laboratory, experimentally pain full reactions can be produced by applying noxious (unpleasant) stimuli such as (i) thermal (radiant heat as a source of pain), (ii) chemical (irritants such as acetic acid bradykinin) and (iii) physical pressure (tail compression). In practice, commonly used procedures are tail flick (tail-withdrawal from the radiant heat) method using analgesiometer, hot plate (jumping from the hot plate at 55ºC) method and acetic-induced writhing method.

The analgesiometer provides pain stimulus by heated nichrome wire in a rat's tail to determine analgesic effects of drugs. It consists of an electrically heated nichrome wire there are metallic squares tubes through which cold water is circulated. Thus only part above nichrome wire is heated while other part is not affected. The circulation of cold water prevents dispersion of heat in the surrounding area. The heated nichrome wire (55ºC) acts as noxious stimulus and the time taken to produce the effect is noted down.

EXPERIMENTAL ANIMALS

All experimental protocols and procedures were approved by the Institutional Animal Ethics Committee of Chalapathi Institute of Pharmaceutical Sciences. Male swiss albino mice between 8 and 10 weeks old, weighing 20-25 g, were used throughout the study. The animals were housed in standard laboratory conditions (12-h light/dark cycle, 21 ± 1°C, and relative humidity of 55 ± 5%) with free access to food and water prior to the experiments. After 7 days of acclimatization to laboratory conditions, the animals were randomly assigned to experimental groups, each consisting of 5 mice. Each animal was used only once in the experimental procedures. All experiments were carried out between 9 a.m. and 3 p.m.

MATERIAL AND METHODS

Treatment Groups

Group-1

Control group (0.9% normal saline 1ml/ kg orally)

Group-2

Standard group (Pentazocin 20 mg/kg-1 i.p)

Group-3

Benzene leaf extracts (TPBE 100mg/kg i.p)

Group-4

Chloroform leaf extracts (TPCE 100mg/kg i.p)

Group-5

Methanolic leaf extracts (TPME100mg/kg i.p)

Procedure

Healthy male swiss albino mice (20 - 25g) were weighed and marked with picric acid. The tip of the tail (last 1-2 cms) was placed on the radiant heat source and basal time was noted down. The tail withdrawal from the heat (flicking response) is taken as the endpoint. The time in seconds required for flicking response was recorded as the reaction time. Normally a mouse withdrawals its tail within

3-5 sec. A cut off period of 10-12 sec was observed to prevent damage to tail. At least 3-5 basal reaction times for each mouse at a gap of 5 minutes were taken to confirm normal behavior of the animal. Animal were treated with drugs as per the above schedule and the reaction time is recorded at 5, 15, 30 and 60 minutes after the drug administration. Percentage increase in reaction time is calculated at each time interval.

Statistical Analysis

All the values are expressed as mean±SD. Statistical significance was determined using two way ANOVA, followed by Dunnett's test. $P<0.05$ was considered to be significant.

RESULTS AND DISCUSSION

The methanolic leaf extracts has shown significant analgesic activity when compared with benzene and chloroform leaf extracts and control treatment groups using tail flick method (Table No.1 and Figure No.1).

Table No.1: Response time (Tail flicking)

S.No	Treatment	Reaction Time in Seconds (Mean± SEM)		
		30 min	60 min	90 min
1	Control	2±0.47	3±0.47	2.25±0.72
2	Standard Pentazocine (20mg/kg)	3±0.81	6±0.94	7±1.49
3	TPBE - (100mg/kg)	2±0.66	3±1.05	4±1.05
4	TPCE - (100mg/kg)	3±0.47	4±0.47	5±0.94
5	TPME - (100mg/kg)	4±0.47	5±0.47	6±1.05

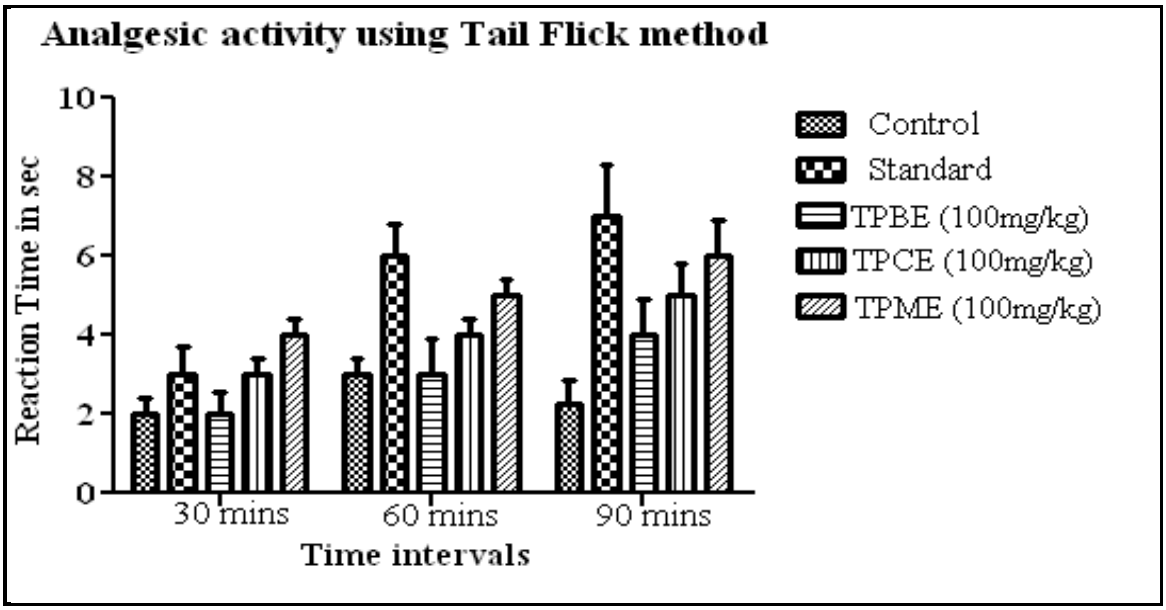

Figure No.1: Analgesic activity by tail flick method

CONCLUSION

Analgesic models for studying drugs or conditions that affect nociceptive process was standardized and evaluated by using leaf extracts of *Tragia plukenetii R. Smith*. The methanolic leaf extracts has shown significant analgesic activity when compared with benzene and chloroform leaf extracts and control treatment groups using tail flick method may be due to the presence of flavonoids.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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