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Pharmacological Evaluation OF Leaf Extracts OF *Tragia Plukenetti R. Smith*

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ABSTRACT

The study was undertaken to evaluate the analgesic and anti-inflammatory activity of *Tragia plukenetii R. Smith* leaf extracts using eddy's hot plate method, undiluted fresh egg albumin induced rat paw oedema method respectively. The study comprised of four treatment groups (control, standard and test - *Tragia plukenetii* aqueous and methanolic leaf extract) all with six animals in each group. At the end of the study aqueous leaf extract showed significant analgesic activity when compared with methanolic leaf extract, standard and control treatment groups.

Keywords: *Tragia plukenetii,* Euphorbiaceae, analgesia, anti-inflammatory

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INTRODUCTION

Pain is a symptom of many diseases requiring treatment with analgesics. Severe pain due to cancer metastases needs the use of strong analgesics that means opioid drugs. The addiction liability of opioids led to intensive research for compounds without this side effect. Many approaches have been used to differentiate the various actions of strong analgesics by developing animal models not only for analgesic activity but also for addiction liability. Several types of opioid receptors have been identified in the brain allowing *in vitro* binding tests. However, the *in vitro* tests can only partially substitute for animal experiments involving pain. Pain is a common phenomenon in all animals, at least in vertebral animals, similar to that felt by man. Analgesic effects in animals are comparable with the therapeutic effects in man. Needless to say, that in every instance painful stimuli to animals must be restricted as much as possible. Painful stimuli can consist of direct stimulation of the efferent sensory nerves or stimulation of pain receptors by various means such as heat or pressure. The role of endogenous peptides such as enkephalins and endorphins gives more insight into rain processes and the action of central analgesics. Inflammation was characterized two thousand years ago by Celsus by the four Latin words: rubor, calor, tumor and dolor. Inflammation has different phases: the first phase is caused by an increase of vascular permeability resulting in exudation of fluid from the blood into the interstitial space, the second one by infiltration of leukocytes from the blood into the tissues and the third one by granuloma formation. Accordingly, anti-inflammatory tests have to be divided into those measuring acute inflammation, subacute inflammation and chronic repair processes. In some cases, the screening is directed to test compounds for local application. Predominantly, however, these studies are aimed to find new drugs against polyarthritis and other rheumatic diseases. Since the etiology of polyarthritis is considered to be largely immunologically, special tests have been developed to investigate various immunological and allergic factors.

EXPERIMENTAL ANIMALS

Wistar rats of either sex (200-300g) were maintained for 7 days in the animal house of Chalapathi Institute of Pharmaceutical Sciences, Guntur under standard conditions temperature (24 ± 10 C), relative humidity (45-55%) and 12:12 light: dark cycle. The animals were fed with standard rat pellet and water ad libitum. The animals were allowed to acclimatize to laboratory conditions 48 h before the start of the experiment. 6 rats/group were used in all sets of experiments. All the experiments were conducted after obtaining permission from the Institutional Animal Ethics Committee (IAEC) Chalapathi Institute of Pharmaceutical Sciences, Guntur.

SELECTION OF DOSE AND TREATMENT PERIOD

Screening for analgesic activity

Wistar rats (200-300g) of either sex were divided into four groups containing six animals in each. A control group received 0.9% normal saline 2ml/kg orally, while second group

received standard drug (Pentazocine) and other groups the standardized aqueous and methanolic extract of *Tragia plukenetii R.Smith*[1-5] at doses 10 mg /kg^{-1} p.o, respectively.

The temperature of hot plate was maintained at 55±0.5°C. The rats were placed individually on hot plate and time between placement and licking of paws, shaking or jumping off the surface was recorded by using Eddy's hot plate apparatus. As a response latency rat with baseline latencies of less than 5 sec or more than 15 sec were eliminated from the study and cut off latency time was set at 15 sec to avoid tissue damage. After determination of base line response latencies, hot plate latencies were re determined at 0, 30, 60, 120 and 180 min after drug administration[6-8].

Screening for anti-inflammatory activity

Wistar rats (200-300g) of either sex were divided into four groups containing six animals in each. A control group received 0.9% normal saline 5ml/kg i.p, while second group received standard drug (Indomethacin) and other groups the aqueous and methanolic extract at doses 10 mg /kg^{-1} i.p, respectively.

Acute inflammation was produced by the sub-planter administration of 0.1ml fresh egg albumin into the right hind paw of each rat 1hour after administration of respective extracts. The paw volume was measured at 0min and 180mins, taking the readings at 30mins intervals, after the egg- albumin administration by displacement technique using plethysmometer[9-11].

STATISTICAL ANALYSIS

All the values are expressed as mean ± SD. Statistical significance was determined using One Way-ANOVA, followed by Dunnet's test. P<0.05 was considered to be significant.

RESULTS AND DISCUSSION

Analgesic activity

Table 1: The analgesic activity of aqueous and methanol extract of Tragia plukenetii using the hot plate method

GROUP	DOSE	REACTION TIME IN SECS				
		BASAL	30MIN	60MIN	120MIN	180MIN
Control	2ml/kg	4.56±0.03	5.183±0.03*	5.42±0.031*	6.067±0.012*	6.23±0.014*
Pentazocine	10mg/kg	4.33±0.03	7.890±0.05*^{a}	7.25±0.04*^{a}	7.02±0.015*^{a}	6.81±0.011*
Aqueous	10mg/kg	4.91±0.02	7.022±0.02*^{ab}	7.69±0.04*^{ab}	7.29±0.02*^{ab}	7.15±0.008*^{ab}
Methanol	10mg/kg	4.78±0.01	5.360±0.01*	5.60±0.014*	6.083±0.008*	6.313±0.009*

Values represent Mean±SEM, n = 6. One way ANOVA followed by Dunnett's multiple comparison test *p<0.05, *^{ab} p<0.01 compare with control group.

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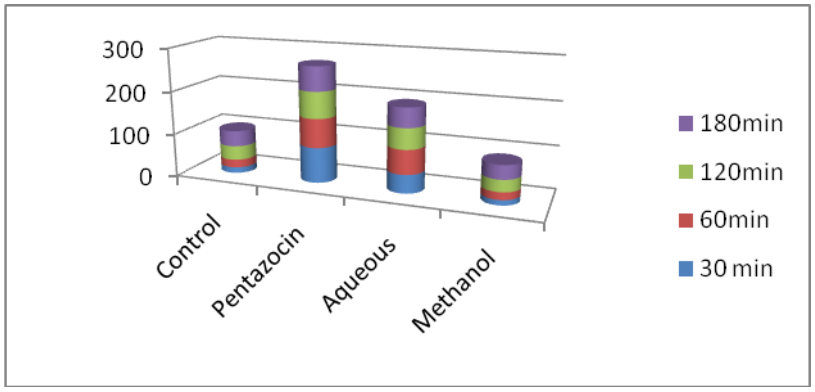

Figure 1: Analgesic activity of various treatment groups.

Anti-inflammatory activity

Table 2: Anti-inflammatory activity by paw edema method

GROUP	*DOSE*	*PAW VOLUME IN (ml) AT VARIOUS TIMES*				
		30 Min	60 Min	120 Min	180 Min	240 Min
Control	5ml/kg	0.28±0.02	0.45±0.06	0.68±0.01	0.79±0.04	0.62±0.02
Diclofenac	20mg/kg	0.18±0.07	0.23±0.05	0.35±0.07	0.43±0.02	0.37±0.05
Aqueous	10mg/kg	0.19±0.05	0.24±0.04	0.39±0.09	0.41±0.06	0.34±0.07
Methanol	10mg/kg	0.25±0.06	0.4±0.05	0.62±0.08	0.69±0.07	0.54±0.03

Values represent Mean±SEM, n = 6. One way ANOVA followed by Dunnett's multiple comparison test.

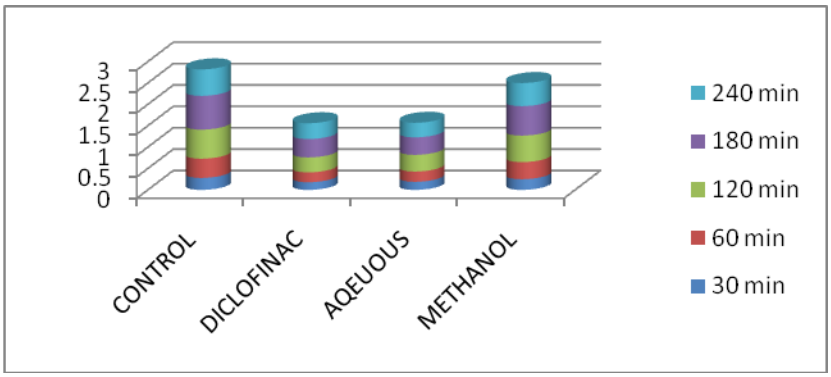

Figure 2: Anti-inflammatory activity by paw edema method

CONCLUSION

Both the aqueous and methanolic extract has shown significant central analgesic activity done by using hot plate method in rats, however aqueous extract has shown significant analgesic activity when compared with other treatment groups. Similarly both aqueous and methanolic extract has shown profound anti-inflammatory activity performed by using plethysmometer by egg-albumin induced paw edema method, however aqueous

extract has shown significant anti-inflammatory activity when compared with other treatment groups.

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