

Evaluation of the analgesic action of the different extracts of *Tecomaria capensis* leaves

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ABSTRACT

Tecomaria Capensis (family: Bignoniaceae) also known as Cape-honeysuckle. In the present study, crude Ethyl Acetate (EAE), Ethanol(EE), Water(WE) of leaves part of *Tecomaria Capensis* has been evaluated for the analgesic (100,200 mg/kg, ip). The analgesic activity was assayed in thermal methods: Hot Plate, Tail flick (thermally induced pain) the water extract and Ethanolic extract shows significant action than the Ethyl Acetate extract. The result shows that water and Ethanolic extract shows potent analgesic activity may be because of different chemical compounds present in that extracts.

Keywords: *Tecomaria capensis*, Analgesic, Tail flick method.

INTRODUCTION

Tecomaria capensis (family:Bignoniaceae) also known as Cape-honeysuckle is a fast growing, scrambling shrub which may grow up to 2-3m high and spread more than 2.5m. *Tecomaria capensis* is an evergreen plant in warm climate areas but loses its leaves in colder areas. It has pinnately compound leaves that have oval leaflets with blunt teeth. Flowering time for this shrub is very erratic and often it flowers all year round. Flowers are orange in color. Plant is used as a traditional medicine to relieve pain and sleeplessness [1]. Dried powdered bark infusions are taken for sleeplessness [2], reported to induce sleep [3] It included in the list of African plants evaluated for *in vitro* antiplasmodial activity against *Plasmodium falciparum* [4]. In the present study, we report the analgesic activities of diffrent extract of *Tecomaria capensis*..

MATERIALS AND METHODS

Plant material and preparation of extracts

The leaves of *Tecomaria capensis* were collected from Guntur, Andhra Pradesh. It was authenticated by Professor (Dr).S.M.Khasim, Department of Botany and Microbiology, Acharya Nagarjuna University, Nagarjuna nagar,Guntur. The leaf part of *Tecomaria Capensis* was dried at room temperature and grounded into powder and passed through 60# sieve. The powder (500 gm) was extracted successively in soxhlet by Ethyl Acetate, Ethanol, and Water. The sediments were filtered and filtrate were dried at 40 °C in an oven to get dried The different fractions obtained were used for further study.

Animals

Male Swiss mice (20–25 g) were used for the study and were maintained at controlled room temperature (21±2 °C) on a 12 h light/dark cycle with free access to food and water *ad libitum*. To study the following activities, the animals were divided into eight groups, each group containing six animals.

Group 1 - for control

Group 2 for standard;

Group 3 and 4 for EAc (100 mg/kg and 200 mg/kg);

Group 5 and 6 for EE (100 mg/kg and 200 mg/kg);

Group 7 and 8 for WE (100 mg/kg and 200 mg/kg respectively).

Drug

Pentazocine (10 mg/kg, i.p.) and a dose of 100 mg/kg and 200 mg/kg of EAE, EE and WE were used for activity study. The doses were prepared in 1% aqueous suspension of gum acacia and route of administration was IP.

Acute toxicity studies

The acute toxicity was performed according to OECD 423, 2001. The selected female albino rats were used to determine the dose. The animals were divided into twelve groups of three in each. The animals were fasted overnight prior to the acute experimental procedure. Distilled water was used as vehicle to suspend the extracts and administered orally as following doses – 100, 300, 1000 and 2000 mg/kg body weight. Immediately after dosing, the animals were observed continuously for first four hours for behavioral changes and for mortality at the end of 24hrs and daily for 14 days respectively [5].

Assessment of Analgesic activity

Hot plate method

The parameter evaluated for was the latency time for paw licking and jumping response after exposure on surface of hot plate. The standard used was Pentazocine (10 mg/kg, i.p.) The hot plate temperature was kept at 500 ± 1 °C and the cut off time was 15 sec [6, 7].

Tail flick method

The tail flick response of mice was measured by means of tail flick unit. The tail of the mices was placed on a hot wire, and the time taken by the animal to withdraw (flick) its tail from the

hot wire was taken as the reaction time. A cutoff time of 3 sec was followed to prevent any injury to the tail. The tail flick test was performed after the oral administration of the plant extracts (100 and 200 mg/kg) or the reference drug Pentazocine (10 mg/kg, i.p.) and the mean reaction time was noted [8, 9].

Statistical Analysis

The results were expressed as mean $\pm$ S.D. All statistical comparisons were made by Dennett's test after conducting one way ANOVA.

RESULTS AND DISCUSSION

A preliminary acute toxicity study in mice showed that all the three extracts were not toxic ($LD_{50} > 1000\text{mg/kg}$).

Analgesic activity

Hot plate method

The water extract and ethanol extract (100 and 200mg/kg, i.p.) shows increase the latency time significantly in dose and time dependent manner to the thermal stimulus. (Table 1)

Tail flick method

In this method also water extract and ethanol extract shows significant analgesic activity in dose and time dependent manner. Water extract also shows significant action at higher dose. (Table 2)

Table: 1 Analgesic activity of different extracts of *Tecomaria Capensis* leaves by Eddys hot plate method

TREATMENT	i.p.(mg/kg)	BEFORE ADMINISTF	AFTER ADMINISTRATION OF DRUG		
			30 MIN	60 MIN	120 MIN
CONTROL	-	5.83 $\pm$ 0.48	5.00 $\pm$ 0.58	4.33 $\pm$ 0.49	4.50 $\pm$ 0.76
STANDARD	10	5.00 $\pm$ 0.52	15 $\pm$ 0	15 $\pm$ 0	14.17 $\pm$ 0.54
ETHYL ACETATE LOW DOSI	100	5.83 $\pm$ 0.65	15 $\pm$ 0	13.33 $\pm$ 0.67*	11.33 $\pm$ 1.12*
ETHYL ACETATE HIGH DOS	200	5.50 $\pm$ 0.43	15 $\pm$ 0	14.50 $\pm$ 0.34	13.17 $\pm$ 0.79
ETHANOL LOW DOSE	100	5.50 $\pm$ 0.76	15 $\pm$ 0	15 $\pm$ 0	15 $\pm$ 0
ETHANOL HIGH DOSE	200	5.33 $\pm$ 0.49	15 $\pm$ 0	15 $\pm$ 0	15 $\pm$ 0
AQUEOUS LOW DOSE	100	5.67 $\pm$ 0.67	15 $\pm$ 0	15 $\pm$ 0	14.33 $\pm$ 0.49
AQUEOUS HIGH DOSE	200	5.83 $\pm$ 0.70	15 $\pm$ 0	15 $\pm$ 0	14.50 $\pm$ 0.50

One way ANOVA followed by Dunnet's test. Values are mean $\pm$ S.E.M. n = 6 in each group. *P < 0.05 when compare d to standard.

In present study three extracts (EAE, EE, WE) of leaf part of *Tecomaria capensis* were studied for analgesic activity by hot plate method and tail flick method (thermal stimuli) Observed readings were tabulated in Table no:1 and 2. Pain is centrally modulated via a number of complex processes including opiate, dopaminergic, descending noradrenergic and serotonergic systems[10,11]. The hot-plate and tail flick tests are useful in elucidating centrally mediated anti-nociceptive responses, which focuses mainly on changes above the spinal cord level [12,13]. The hotplate method and tail flick test are considered to be selective to examine compounds acting through opoid receptor; different extracts of *Tecomaria Capensis* leaves increased mean basal latency which indicates that it may act via centrally mediated analgesic mechanism. Narcotic

analgesics inhibit both peripheral and central mechanism of pain, while non steroidal anti-inflammatory drugs inhibit only peripheral pain [14,15]. The extracts inhibited both mechanisms of pain, suggesting that the plant extract may act as a narcotic analgesic. It also reported that the inhibition of pain could arise not only from the presence of opioids and/or opiodiomimetics but could also arise from the presence of phenolic constituents [16] and also steroidal constituents [17] So, it may be due to the similar type of constituents present in the water extract and of *Tecomaria Capensis* which is, exhibited the analgesic activity.

Table: 2 Analgesic activity of different extracts of *Tecomaria Capensis* leaves by Tail flick method

GROUP	i.p.(mg/kg)	BEFORE ADMINISTF	AFTER ADMINISTRATION OF DRUG		
			30 MIN	60 MIN	120 MIN
CONTROL	-	1.50±0.22	1.33±0.21	1.33±0.21	1.50±0.34
STANDARD	10	1.33±0.21	3±0	3±0	3±0
ETHYL ACETATE LOW DOSE	100	1.17±0.17	3±0	2.67±0.21	2.33±0.21
ETHYL ACETATE HIGH DOSE	200	1.33±0.21	3±0	3±0	2.67±0.21*
ETHANOL LOW DOSE	100	1.33±0.21	3±0	3±0	3±0
ETHANOL HIGH DOSE	200	1.50±0.22	3±0	3±0	3±0
AQUEOUS LOW DOSE	100	1.33±0.21	3±0	3±0	2.67±0.21
AQUEOUS HIGH DOSE	200	1.50±0.22	3±0	3±0	2.83±0.17

One way ANOVA followed by Dunnet's test. Values are mean ±S.E.M. n = 6 in each group. *P< 0.05 when compare d to standard.

CONCLUSION

Based on the results of the present study, we conclude that the different extracts of *Tecomaria Capensis* leaves possesses strong analgesic activity in dose dependent manner. However, further studies are necessary to examine underlying mechanisms of analgesic effects and to isolate the active compound responsible for these pharmacological activities.

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