Research Article
www.ijrap.net

ANTI-INFLAMMATORY ACTIVITY OF LEAF EXTRACTS OF *TECOMARIA CAPENSIS* IN RATS

Pannem Venkatesh*, Alapati Sriram, Gadda Praveen, Elamaran Tamil Jothi, P. Srinivasa Babu
Dept of Pharmacology, Vignan Pharmacy College, Vadlamudi, Guntur Dist., A.P, India

Received on: 11/01/12 Revised on: 20/02/12 Accepted on: 18/03/12

***Corresponding author**
Pannem Venkatesh, Student. Email: pannem_venky@yahoo.co.in

ABSTRACT
In the present study ethanolic and ethlylacetate extracts of leaves of *Tecomaria capensis* were screened for anti-inflammatory activity in carrageenan induced paw edema in rats. The activity was assessed by difference in paw edema volume, before and after administration of different doses of extracts in rats. The anti-inflammatory effect was compared with standard drug (Indomethacin 10mg/kg/ml). These observations helped us to conclude that the high doses of ethanolic and ethlylacetate extracts were endowed with anti-inflammatory property.
Keywords: Anti-inflammatory, Indomethacin, Plethysmograph, *Tecomaria Capensis*

INTRODUCTION

Inflammation is a local protective response of the body to the tissue injury. Research in the last few decades demonstrated that inflammation is regulated by many pro and anti-inflammatory chemical mediators such as histamine, prostaglandins (PGE_2 and Prostacyclins), Leukotrienes (LTB_4), Serotonin, Bradykinin, Cytokines (IL-1,IL-6,IL-8,IL-11,TNFα), reactive oxygen species, growth factor, lysosomal enzyme of neutrophils. The extent of involvement of these chemical mediators varies depending upon the nature of inflammation[1,2]. *Tecomaria capensis* (Family: Bignoniaceae) also known as cape-honeysuckle is a fast growing, scrumbling shrub which may grow up to 2-3m high and spread more than 2.5m. *Tecomaria capensis* is an ever green plant in warm climate areas but loses its leaves in colder areas. It has pinnately compound leaves that have oval leaflets with blunt teeth. Flowers are orange in colour. Plant is used as traditional medicine to relieve pain and sleeplessness[3] .Dried powdered bark infusions are taken for sleeplessness[4], reported to induce sleep[5]. It is included in the list of African plants evaluated for invitro antiplasmodial activity against *Plasmodium falciparum*[6].

MATERIALS AND METHODS

Plant Material and Extraction Procedure

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, Guntur. The specimen (No: ANU/00129/2009/AP) was deposited in the department of botany and microbiology for future reference. The leaf part of *Tecomaria capensis* was dried at room temperature and grounded into powder and passed through 60# sieve. The powder (500gm) was extracted successively in Soxhlet extractor by ethanol and ethyl acetate. The sediments were filtered and the filtrate was dried at 40^0C in an oven to get dried product. The different fractions obtained were used for further study.

Animals

Albino rats (150-250 gm). Each of either sex was kept under standard environmental conditions (25±2ºC under 12 h light and 12 h dark cycles) in polypropylene cages. Standard animal feed and drinking water were provided ad libitum throughout the experimental period. The animals were acclimated to laboratory conditions one week prior to the initiation of experimental work. The animals were divided into seven groups of six each. Experiments are conducted as per standard protocol followed with CPCSEA guidelines prior approval of IAEC (1499/po/a/11/CPCSEA).

Anti-Inflammatory Studies

Carrageenan induced hind paw edema

The animals were divided into seven groups of six animals each and were fasted for a period of 24 hours prior to the study. Group 1 was treated as control, Group 2 served as negative control which received only 0.1 ml of a 1% solution of carrageenan in saline. Group 3 served as standard which received indomethacin 10mg/kg/ml suspended in 1% sodium carboxymethylcellulose. Group 4 and 5 were treated with 100 and 200 mg/kg/ml of ethyl acetate extracts of *Tecomaria capensis* leaves suspended in DMSO respectively. The 6 and 7 groups were treated with 100 and 200 mg/kg/ml of ethanolic extracts of *Tecomaria capensis* leaves respectively. Edema was induced by injecting 0.1 ml. of a 1% solution of carrageenan in saline into the sub plantar region of the right hind paw of the rats. The vehicle, extracts and the standard drugs were administered 60 min. prior to the injection of the phlogestic agent. The volumes of edema of the injected and the contra lateral paws were measured at 1, 2, 3, 6, 8 hours after the induction of inflammation using a Plethysmograph to calculate the percentage of paw edema inhibition[7,8].

Evaluation of Anti-Inflammatory activity

Determination of Inhibition of Paw edema

The percentage inhibition of rat paw edema was calculated and compared with that of standard indomethacin. Indomethacin produced a 3.43% reduction in paw edema when observed after 3 hours of carrageenan injection. The ethyl acetate extract of low dose and ethyl acetate extract of high dose of *Tecomaria capensis* significantly inhibited the paw edema by 1.37% and 3.43% respectively. In case of low dose of alcoholic

extract and high dose of alcoholic extract of *Tecomaria Capensis,* which gave an inhibition of 0.69% and 2.06% paw edema, however they didn't attain the statistical significant value compared to saline treated group.

Statistical Analysis

The values are expressed as mean ± S.E.M. Statistical Analysis was performed using ANOVA (one way).

RESULTS AND DISCUSSION

The ethyl acetate and ethanolic extracts of leaves of *Tecomaria capensis* have been tested for their possible anti inflammatory activity in Albino rats of seven groups, each group containing six animals of either sex weighing between 150-250 gm. The first group received saline which served as control. Second group served as negative control received only 0.1 ml. of a 1% solution of carrageenan in saline, the third group was given standard NSAID indomethacin drug (10mg/kg/ml/) orally, which served as standard anti-inflammatory agent. The fourth and fifth groups received the low dose (100mg/kg/ml) and high dose (200mg/kg/ml) of ethyl acetate suspension of *Tecomaria capensis* respectively, orally. The sixth and seventh groups received the low dose (100mg/kg/ml.) and high dose (200mg/kg/ml.) of ethanolic extract suspension of *Tecomaria capensis* respectively, orally. The results are shown in Table 1. The percentage inhibition of rat paw edema was calculated and compared with that of standard indomethacin. Indomethacin produced a 3.43% reduction in paw edema when observed after 3 hours of carrageenan injection. The ethyl acetate extract low dose and ethyl acetate extract high dose of *Tecomaria capensis* significantly inhibited the paw edema by 1.37% and 3.43% respectively. In case of ethanolic extract Low dose and ethanolic extract high dose of *Tecomaria Capensis,* which gave an inhibition of 0.69% and 2.06% paw edema, however they didn't attain the statistical significant value compared to saline treated group. According to statistical analysis of anti-inflammatory data, we can say that the values were significantly different from the control or saline group at $P< 0.05$ (ANOVA, followed by Student's t-test).

Table 1: **Effect of Ethanol and Ethyl acetate extracts on Carrageenan-Induced hind Paw Edema**

Group	Edema volume in ml					
	0 hour	1 hour	2 hour	3 hour	6 hour	8 hour
Control	6.850±0.05	6.8±0	6.85±0.05	6.8±0	6.8±0	6.85±0.05
Negative	6.8±0	7±0.2	7.15±0.05	7.3±0.1	7.35±0.05	7.4±0
Standard	6.85±0.05	6.95±0.15	7.05±0.25	7.05±0.05	7.1±0.1	7.15±0.25
Ethyl acetate low dose	6.85±0.05	6.9±0.1	7.0±0.1	7.2±0.2	7.25±0.05*	7.3±0*
Ethyl adetate high dose	6.8±0	6.85±0.05	6.95±0.15	7.05±0.05*	7.15±0.05*	7.2±0*
Ethanol low dose	6.85±0.05	6.95±0.15	7.05±0.25	7.25±0.05*	7.3±0.1**	7.35±0.05*
Ethanol high dose	6.8±0	6.9±0	6.95±0.15	7.15±0.05*	7.2±0	7.25±0.05*
*p≤0.05, **p≤0.1when compared with control, n=6						

CONCLUSION

It is concluded that Ethyl acetate extract of leaves of *Tecomaria capensis* possess significant anti-inflammatory activity against experimentally induced paw edema in rats. This may be due to the presence of reported active phytoconstituents and their influence on the prostaglandins pathway. Further research, to isolate the compound which is responsible for anti-inflammatory action and exact mechanism involved, is to be studied.

ACKNOWLEDGMENT

The authors are thankful to the Management and Staff members of Vignan Pharmacy College, Vadlamudi, Guntur Dist, and A.P for their support.

REFERENCES

1. Sommer CV, Parth CM. Inflammation, tissue repair and fever. In: Parth CM. Essentials of pathophysiology-Concepts of Altered health Sciences 3rd edition. New York. Lippincott Williams and Wilkins, 2006: p 495-514.
2. Chenusu SW, Ward PA. Inflamation In: Kissane JM. Editor Anderson's Pathology 10th edition. Missouri: The CV Mosby, 1996; p 387-400.
3. South African National Biodiversity Institute's (SANBI) Integrated Biodiversity System, information [home page on the Internet] [cited 2010 December 10] Available from: URL:http//www.plantzafrica.com/planttuv/tecomar cap.htm
4. Roberts M. Indigenous Healing Plants. Halfway House. Southern Book Publishers., 1990.
5. Hutchings A, Scott AH, Lewis G, Cunningham AB, Zulu medical plants; An Inventory. University of Natal press, Pietermaritzburg, 1996.
6. P Pillaya, VJ Maharaj, PJ Smith, Investigating South African plants as a source of new antimalarial drugs, Journal of Ethanopharmacology, 2008; 119:438-454.
7. Kulkarni SK. In: Hand Book of Experimental Pharmacology, Vallabh Prakashan. Third and Revised Edition, Delhi; 2002. p. 128-130.
8. Antarkar SS, Chinwalla T, Bhatt N, Anti-inflammatory activity of *Rubia cordifolia Linn*. In Rats, Indian Journal of Pharmacology, 1994; 15(3): 185-188.

Source of support: Nil, Conflict of interest: None Declared