
INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN CHEMISTRY AND PHARMACEUTICAL SCIENCES

(p-ISSN: 2348-5213; e-ISSN: 2348-5221)

www.ijcreps.com

(A Peer Reviewed, Referred, Indexed and Open Access Journal)

DOI: 10.22192/ijcreps

Coden: IJCROO(USA)

Volume 9, Issue 12 - 2022

Research Article



DOI: <http://dx.doi.org/10.22192/ijcreps.2022.09.12.005>

Evaluation of Anti Pyretic activity and Anti inflammatory activity on Male wistar rats of the drug Santhanathi kuligai

Priyadharshini S¹, Subaraj S²

¹ [Kuzhanthaimaruthuvam], Ganapathynagar, Metuppatty gate, Pudukkottai, Tamil Nadu, India

² [Kuzhanthai maruthuvam], Veeravanallur, Tirunelveli.

Corresponding Author: Dr.S.Priyadharshini

E-mail: spriyadharshini1221@gmail.com

Abstract

The anti pyretic and anti inflammatory of the drug santhanathi kuligai were evaluated in male wistar rats. In pharmacological studies the wistar rats are grouping into five categories and then evaluated. The results obtained showed that the drug contain some biologically active principles that may active against fever and inflammatory conditions. The drug has an anti inflammatory effect demonstrated by its inhibitory effect on egg albumin induced paw edema.

Keywords: V, anti pyretic and anti inflammatory, wistar rats, paw edema.

Introduction

Siddha system is one of the earliest traditional medicine systems in the world which treats not only the body but also the mind and the soul. Siddha system is a comprehensive system that places equal emphasis on the body, mind and spirit and strives to restore the innate immunity of the individual. The three fundamental components that make up the human constitution .These three components are vata,pitta and kaph a(representing air, fire and water respectively).

The trial drug **SANTHANATHI KULIGAI** is selected for the present study which is purely a herbal medicine as it is easily available and effective to infant and children. The ingredients of santhanathikuligai have the property of relieving the symptoms of kanasuram without any adverse effects. The analysis synthesis and formulation of theories would go a long way in understanding the relations between structure function and origin of the most basic properties of the body, health, disease and medicine.

The present study were to evaluate the Anti-inflammatory and Anti – pyretic activity of Santhanathikuligai using egg albumin induced Anti – inflammatory model and Brewer’s Yeast induced Anti- Pyretic activity in Male wistar rats.

Materials and Methods

Drugs and Chemicals:

Egg albumin, Brewer’s Yeast, Paracetamol, Diclofenac was purchased from CAPE Biolabs, Marthandam, TamilNadu.

Dose Concentration of trial drug:

Human therapeutic dose of was mentioned in Siddha text as 500 mg thrice a day for adult, animal equivalent dose was calculated using allometric dose translations. considering weight of normal adult as 60 kg, animal equivalent dose calculated as

$$\begin{aligned} \text{Human equivalent dose} &= \text{Adult dose} / \text{Average weight of human (60)} \\ &= 130 / 60 \\ &= 2.16 \text{ mg/kg} \end{aligned}$$

Animal equivalent dose = Human equivalent dose (mg/kg) X Conversion factor

$$\begin{aligned} \text{Animal equivalent dose} &= 2.16 \times 6.17 \\ &= 13.32 \\ &= 13 \text{ mg/kg} \end{aligned}$$

Animals:

Male wistar rats (*Rattus norvegicus*), weighing 200-250 gm were obtained from CAPE Biolabs, Marthandam, TamilNadu. The animals were kept at laboratory animal house of the department of Pharmacology, S A Raja pharmacy College, Raja Nagar, Vadakkangulam, Nagarkovil, Tamil Nadu. The Animals were maintained under a regulated 12 h light/12 h dark scheduled at 24± 1° c and were allowed free access to feed and water ad libitum. All the procedures were conducted in accordance with guidelines as per CPCSEA. The study protocol was approved by the Institutional

Animal Ethical Committee, S A Raja’s College of Pharmacy, Raja Nagar, Vadakkangulam, Nagarkovil, Tamilnadu.

Grouping of animals in Anti inflammatory Activity:

Rats were randomly divided into five groups; First group consists of 2 animals and other four groups consisting of four animals and were named as follows:

- Group I- Normal Control + 0.1 mL of egg albumin
- Group II-Standard - Diclofenac (150 mg/kg body weight) + 0.1 mL of egg albumin
- Group III-Test I-Santhanathikuligai (13mg/kg body weight) + 0.1 mL of egg albumin
- Group IV -Test II- Santhanathikuligai (26mg/kg body weight) + 0.1 mL of egg albumin
- Group V -Test III- Santhanathikuligai (39mg/kg body weight) + 0.1 mL of egg albumin

Grouping of animals in Anti Pyretic Activity:

Rats were randomly divided into five groups; First group consists of 2 animals and other four groups consisting of four animals and were named as follows:

- Group I- Normal Control + 0.1 mL 20% Brewer’s yeast
- Group II-Standard –Paracetamol (2 mg/kg body weight) + 0.1 mL 20% Brewer’s yeast
- Group III-Test I- Santhanathikuligai (13mg/kg body weight) + 0.1 mL 20% Brewer’s yeast
- Group IV -Test II- Santhanathikuligai (26mg/kg body weight) + 0.1 mL 20% Brewer’s yeast
- Group V -Test III- Santhanathikuligai (39mg/kg body weight) + 0.1 mL 20% Brewer’s yeast

Anti pyretic activity:

Anti pyretic activity on rats was studied by fever induced by 20 % Brewer’s Yeast to each rats weighing about 150 – 200 gram uniformly till 24 h before giving drugs, After measuring the initial rectal temperature of the animals by introducing 1.5 cm of digital temperature in rectum, Pyrexia

was induced by injecting, subcutaneously 20% suspension of dry yeast. After 18 hour of yeast injection rats which showed a rise in temperature of atleast 1 degree F was taken for the study. After that test drug Santhanathikuligai at a dose of 13,26,39 mg/kg of body weight was administered. The rectal temperature was noted at 0,1,2,3 and 4 hours for all groups after administration of drug.

Detection of Rectal temperature in male wistar rats

EGG Albumin induced anti- inflammatory activity:

Anti inflammatory activity was measured using egg albumin induced rat paw edemamodel.edema was induced by sub plantar injection of 0.1 ml of egg albumin freshly prepared 20 % in normal saline into the right hind paws of each rat of all the groups. Animals of group I was treated with normal control, Animals of group II was treated with Standard- Diclofenac (150 mg/kg) Group III

Plethysmometer



Egg albumin induced paw edema I Egg albumin induced paw edema II



was treated with Santhanathikuligai (13 mg/Kg P.O) group IV was treated with Santhanathikuligai(26 mg/Kg P.O) and group V was treated with Santhanathikuligai (39 mg/Kg P.O) respectively;30 minutes prior to egg albumin injection.Paw thickness was measured just before the egg albumin injection,thatis,at “0 hour”and then at 1,2,3,4 and 24 th hour after egg albumin injection by plethysmometre.

The Anti inflammatory activity was calculated as percentage inhibition of edema in the animals treated with Santhanathikuligai under test in comparison to the egg albumin control group.

The percentage (%) inhibition of edema was calculated using the formula

$$(\%) \text{ inhibition} = \frac{T_0 - T_1}{T_0} \times 100$$

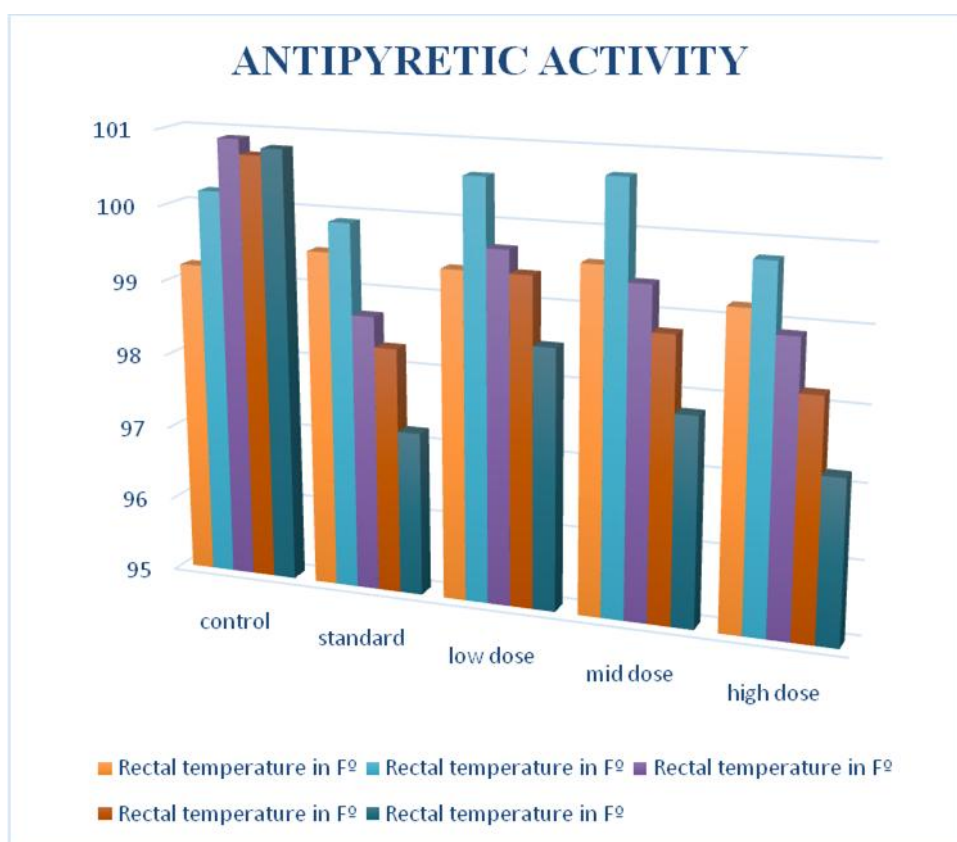
Where T1 was the thickness of paw of rats given test drug at corresponding time and T0 was the paw thickness of rats of control group at the same time.

Results and Discussion

Anti pyretic activity

Table Average

Time in hours	Rectal temperature in F°				
	0 hour	1 hour	2 hour	3 hour	4 hour
control	99.2	100.2	100.9	100.7	100.8
standard	99.5	99.9	98.7	98.3	97.2
low dose	99.4	100.6	99.7	99.4	98.5
mid dose	99.6	100.7	99.4	98.8	97.8
high dose	99.2	99.8	98.9	98.2	97.2



Anti inflammatory activity

Table Error! No text of specified style in document..1-Average

Groups	PAW THICKNESS(in ml)					
	0 hour	1 hour	2 hour	3 hour	4 hour	5 hour
Control	0.28	0.48	0.54	0.84	0.88	0.94
Standard	0.26	0.43	0.58	0.49	0.41	0.35
Low dose	0.24	0.42	0.62	0.66	0.67	0.56
Mid dose	0.23	0.35	0.56	0.62	0.58	0.45
High dose	0.27	0.3	0.49	0.58	0.46	0.39

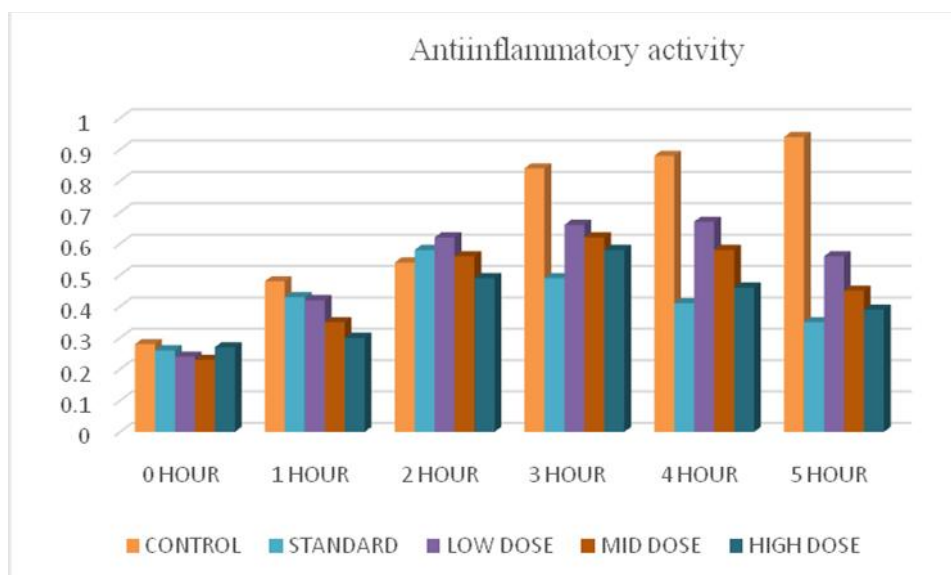


Table - Effect of *Santhanathi Kuligai* and diclofenac sodium as compared to egg albumin control group at different hours in egg albumin-induced paw edema model using digital plethysmometer.

Groups	Paw thickness(in ml)						%inhibition
	0 hour	1 hour	2 hour	3 hour	4 hour	5 hour	
Control	0.28±1.12	0.48±1.16	0.54±1.23	0.84±0.24	0.88±0.32	0.94±1.13	-
Standard	0.26±1.04	0.43±1.14	0.58±1.25	0.49±1.14**	0.41±1.23**	0.35±1.16**	62
Low dose	0.24±0.23	0.42±1.16	0.62±0.84	0.66±0.34	0.67±1.26	0.56±0.26**	40
Mid dose	0.23±0.12	0.35±1.04	0.56±1.05	0.62±1.16**	0.58±1.05**	0.45±1.32**	52
High dose	0.27±0.26	0.30±1.06	0.49±0.64	0.58±0.17**	0.46±1.02**	0.39±0.42**	59

The results are expressed as mean SD (n=5) and analyzed by one way analysis of variance (ANOVA) by GraphPad Prism 9. A value of ** $p < 0.05$ was considered significant compared to the control and standard group.

Statistical analysis:

The results are expressed as mean SD (n=5) and analyzed by one way analysis of variance (ANOVA) by GraphPad Prism 9. A value of $p < 0.05$ was considered significant compared to the control and standard group.

The etiology of yeast induced fever which is considered as pathogenic fever suggests the role of prostaglandins in the thermoregulation of body temperature. The prostaglandin (PGE 2) during the arachidonic acid is considered an important factor for induction of fever.

Conclusion

The results of the current study yeast induced fever model indicates the anti pyretic activity of **SANTHANATHI KULIGAI** kuligai at a dose of 13,26,39 mg/kg of body weight was administered and its effect was comparable to paracetamol. Hence it can be contemplated that the possible mechanism of antipyretic action of santhanathi kuligai may be due to the inhibition of prostaglandin synthesis. It also possess good anti inflammatory property in carrageenan induced paw edema model.

Acknowledgments

My sincere thanks to the head of the department Prof.Dr.D.K.Soundararajan MD(S) Department of Kuzhanthai Maruthuvam, Government siddha medical college, Tirunelveli and Dr.K.Shyamala MD(S) Lecturer Grade II, Department of Kuzhanthai Maruthuvam, Government siddha medical college, Tirunelveli and Dr.K.Livingston and other Lecturers of the department for Guidance.

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DOI: [10.22192/ijcrcps.2022.09.12.005](https://doi.org/10.22192/ijcrcps.2022.09.12.005)

How to cite this article:

Priyadarshini S, Subaraj S. (2022). Evaluation of Anti Pyretic activity and Anti inflammatory activity on Male wistar rats of the drug Santhanathi kuligai. Int. J. Curr. Res. Chem. Pharm. Sci. 9(12): 34-40.
DOI: <http://dx.doi.org/10.22192/ijcrcps.2022.09.12.005>