

# Pharmacological evaluation of Anti-inflammatory and analgesic properties of *Vembu Karpam*

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## ABSTRACT

### Background

In recent years, there has been growing interest in the study of medicinal plants based medicines of Siddha medicines. However, today it is essential to pay for the scientific proof as to whether it is rational to use a plant or any other formulation in any of 32 internal medication forms. Hence the present communication constitutes a pharmacological activities of an Indian medicinal plant, *Azima tetracantha* based preparation *Vembu Karpam*.

### Objectives

The objective is to assess the therapeutic potential of *Vembu Karpam* for its Anti inflammatory and analgesic activities.

### Methodology:

Anti-inflammatory activity on *Vembu karpam* was studied using carrageenan-induced paw edema method with dose of 100mg/kg and 200mg/kg in rats. The dose determination studies were carried out according to OECD guidelines and based on our previous acute toxicity study. Hence, 100 & 200 mg/kg was given for the models for analgesic activity through acetic acid induced writhing reflex in mice.

### Results:

The percentage reduction of paw volume against Carrageenan induced paw oedema was more than the control group and the analgesic activity was also in a significant levels.

### Conclusions:

Our findings confirmed that the anti-inflammatory, analgesic activities of *vembu kudineer* could be beneficial for the treatment of *Uthra vatha suronitham*.

### Keywords

Siddha medicine, Vembu, Bark of neem, Anti inflammatory in Siddha

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## INTRODUCTION

Inflammation in the joints causing pain, swelling, damage to the joints and also leads to deformity. It can occasionally affect other internal organs, such as the eyes, lungs or heart and nerves. The symptoms vary widely from person to person. Arthritis is a disease that can affect multiple joints in the body, often occurring in the spine, hip, knee or other joints in the body, but can also affect the other weight bearing and non-weight-bearing joints. Symptoms of arthritis include joint pain, stiffness, swelling and fatigue. Inflammation if untreated can lead to joint damage, destruction and disability. The onset usually starts over a period of weeks to months, with more joints affected.

Although numbers of synthetic drugs are being used as standard treatment for Joint disorders but they have adverse effect that can compromise the therapeutic treatment. Unfortunately, there is still no effective known medicinal treatment that cures age related joint disorders as the western medicine can only treat the symptoms of this disease that means to relieve pain and inflammation of joints. It is possible to use the herbs and plants in various forms in order to relieve the pain and inflammation in the joints

Before the discovery of synthetic drugs man was completely depends on the medicinal plants for the treatment of disease. In Siddha Medicine, nearly 40% of cases vising in Government Siddha Hospitals over the state of Tamilnadu is only for aged related arthritis. The medicinal value of plants has been recognized by every person of this society even in rurals areas.

A study conducted by World Health Organization (WHO) has reported that about 80% of world's population relies on traditional medicine. In USA, nearly 121 drugs are prescribed today, where 90 % of them come from the natural sources particularly from plants in a direct or indirect manner. In the nineteenth or earlier centuries natural product extracts, particularly those derived from botanical species, provided the main source of folk medicines.

However, in the latter part of the nineteenth century, biologically-active organic molecules began to be isolated in relatively pure form for medicinal use. The present pharmacological work on anti-inflammatory and analgesic action has been studies through invivo animal experimental studies.

## METHODS AND MATERIALS

### Ingredients:

100 years old Vembu (*Azadirachta indica*) - powder.  
Part used – Bark

### Hundred years old bark of Neem Tree

The hundred years old neem bark from the traditional area of Papanasam. In traditional siddha literature, the role of the vembu is quite higher and the life time of plant based

preparation are discussed many. This type of plant has major role in engulfing the clinical conditions of various origins.

### Authentication of drug:

The herbal ingredients are authenticated by Botanist of Department of Medicinal Botany, Government Siddha Medical College, Palayamkottai, Tamilnadu.

### Purifications of Drugs:

The Bark of Vembu was collected outer dead bark are removed off. The foreign particles were observed and cleaned. The inner bark were cut into small pieces and dried in shade. After fully dried condition the bark was once again cleaned.

### Method of Preparation:

The purified dried 100 years old Vembu tree bark is finely powdered.

### Drugs and chemicals

The specified chemicals and drugs were purchased from reputed laboratory from India. Carrageenan (1% w/v), Diclofenac sodium (standard), Acetic acid, Carboxy methyl cellulose : (1% w/v) and few quantity of Tween 20 was purchased from Sigma Aldrich, Bangalore, India. Digital plethysmo meter from U G O Basile (Italy).

### Experimental methods

Anti-inflammatory Studies were carried out in male and female wistar rats (180-200g) and analgesic study was carried out in Swiss albino mice (20-25g) either sex . The animals were obtained from reputed breaded of approved by CPCSEA and grouped and housed in a polypropelene cages and maintained under standard condition of humidity around 50-75% with 12hr in light and 12hr in dark environment cycle.

### Animal feeding :

The animals were fed with standard pellet and water ad libitum. All the procedures were followed based on CPCSEA protocols. The cages were changed in a two day intervals and the weight has noted in necessary time.

### Anti-Inflammatory Activity

The anti-inflammatory activities of siddha formulation *Vembu karpam* at a dose of 100mg/kg and 200mg/kg were evaluated using carrageenan-induced paw edema method. The inflammation was readily produced in the form of edema with the help of irritant such as carrageenan. Carrageenan is a sulphated polysaccharide obtained from sea weed (Rhodophyceae) and when injected cause the release of prostaglandins by the way it produces inflammation and edema.

### Method of Study

Anti-inflammatory activity was performed by the following procedure of Bhandri et al. The animals were divided into 4 groups each having six animals. A freshly

prepared suspension of carrageenan (1% w/v , 0.1 ml) was injected to the planter region of left hind paw of each rat. One group was kept as control and the animals of the other groups were pretreated with the *Vembu karpam*. Test Compounds dissolved with 2 ml sterile water given through intraperitoneally 30 min before the carrageenan treatment. The paw volumes of the test compounds, standard and control groups were measured at 60, 240, 360 minutes of carrageenan treatment with the help of Digital plethysmometer (Ugo basile, Italy). Mean increase in paw volume was measured and the percentage of inhibition was calculated.

$$\% \text{Anti-inflammatory activity} = (Vc - Vt / Vc) \times 100$$

Where, *Vt*-mean increase in paw volume in rats treated with test compounds, *Vc*-mean increase in paw volume in control group of rats.

### Analgesic Activity

Analgesic activity of siddha formulation *Vembu karpam* was evaluated by acetic acid induced writhing reflex in mice. Painful reaction in animals may be produced by the chemicals such as phenylquinone, bradykinin etc. Like that, acetic acid pain reaction which is characterized as a writhing response. Construction of abdomen, turning of trunk (twist) and extension of hind legs are taken as reaction to chemically induced pain. Analgesics (both narcotic and non-narcotic) inhibit writhing response.

### Treatment Protocol for analgesic action

Group-1 Treated as normal control received 10ml/kg of normal saline through orally.

Group-2 Treated as Standard control received 10mg/kg of diclofenac sodium through Intra-peritoneally.

Group-3 Treated as treatment control received 100mg/kg of *Vembu karpam* administered through orally.

Group-4 Treated as treatment control received 200mg/kg of *Vembu karpam* administered through orally.

### Dose administration procedure for analgesic activity

Siddha formulation *Vembu karpam* was administered one hour prior to the acetic acid administration. Note the onset on writhing. Record the numbers of abdominal contractions, trunk twist and extension of hind limbs as well as the number of animals showing such response during a period of 10 minutes were noted.

### Statistical analysis

The analysis was carried out through Trial pack of SPSS 23 version of IBM. Data are expressed as mean  $\pm$  SEM; data analyzed by one way ANOVA followed by Newman's keul's multiple range tests to determine the significance of the difference between the control group and rats treated with the extracts.

## RESULTS

Anti-inflammatory activity of Both dose of siddha formulation *Vembu karpam* at a dose 100mg/kg and 200mg/kg were tested for their Anti-inflammatory activity by using carrageenan Induced rat paw edema method and the results are tabulated in Table no 1. The results reveals that both dose of siddha formulation *Vembu karpam* possesses significant Anti-inflammatory activity when compared to control group at  $p < 0.01$ .

Data are expressed as Mean  $\pm$  S.E.M. Data were analyzed by one way ANOVA followed by Newman's keul's multiple range tests, to determine the significance of the difference between the control group and rats treated with the test compounds. \*a Values were significantly different from normal control at  $P < 0.01$ .

Almost all the varied drug group has almost more than 60% of paw volume reduction in the sense, the potential anti inflammatory activity when compared with normal standard (Fig 1 & 2).

The table values show that analgesic activity of *Vembu karpam* by acetic acid induced writhing reflex. The results reveals that both dose of *Vembu karpam* possess significant analgesic activity at  $p < 0.01$ .

### Discussion

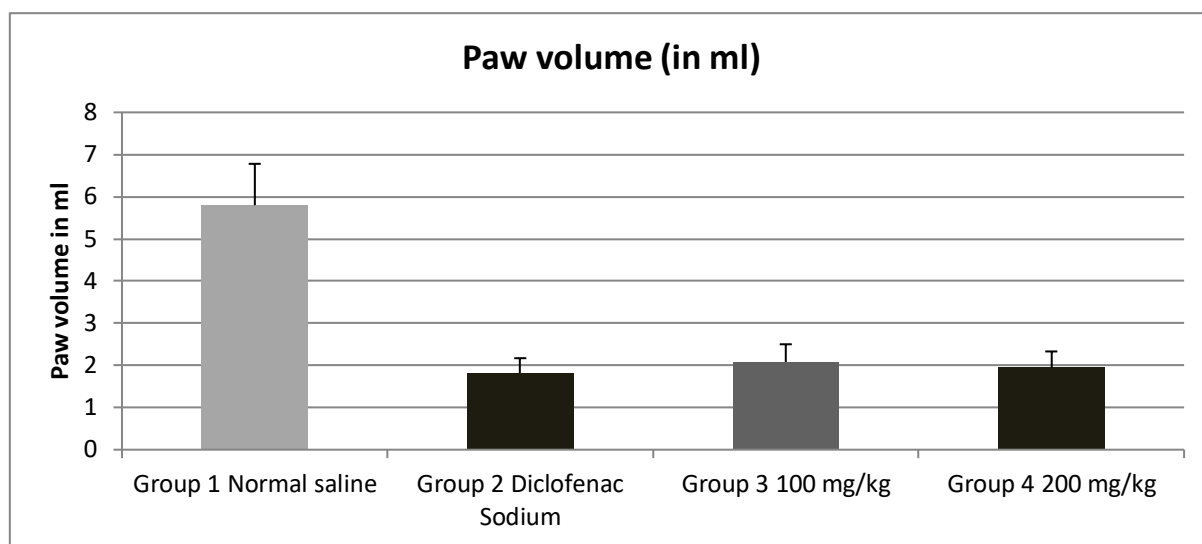
The pharmacological screening of *invivo* Anti-inflammatory and Analgesic models were studied in *Vembu karpam* exhibits high significant action. From Fig 2 and 4, it was seen that treatment by *Vembu karpam* increased the response, which was significant at  $p < 0.01$  in both anti-inflammatory and analgesic studies. Thereby Statistically significant anti-inflammatory & analgesic activity was shown

### Conclusion

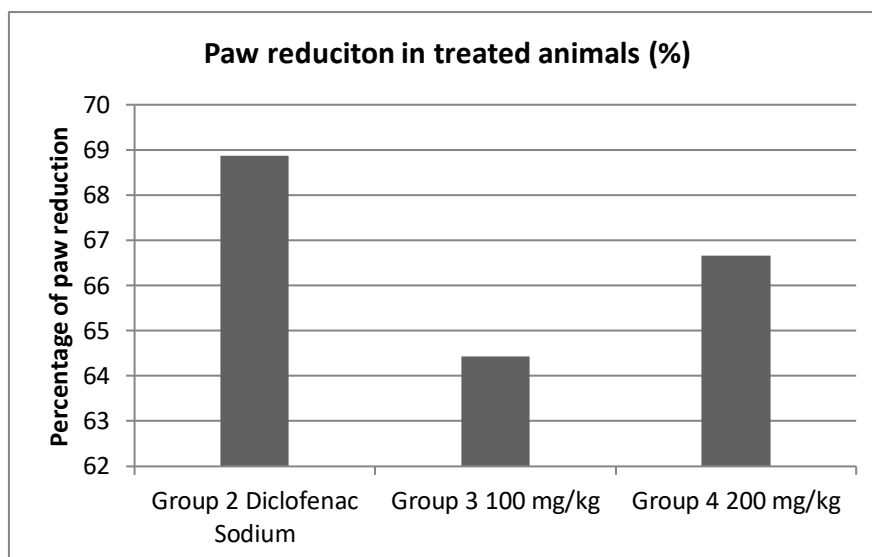
Currently most of the people are widely taking pain reliever of steroidal origin without any consultation and even continuing by purchasing it from Over the counter and using for a long period. Definitely this has been replaced with the drugs of herbal origin. The presence of chemical bioactive components in the different fractions in *Vembu karpam* may be responsible for their anti-inflammatory, analgesic properties .

**Table No.1, Anti-inflammatory activity of *Vembu karpam***

Treatment	Dose (mg/kg)	Paw volume(ml) as measured by mercury displacement at 6 hour	Percentage inhibition of paw edema
<b>Group I</b> Normal saline	10ml/kg orally	5.85±0.98	-
<b>Group II</b> Standard	10mg/kg I.P. Diclofenac sodium	1.82±0.35	68.88%*a
<b>Group III</b> Vembu karpam	100 mg/kg. Orally.	2.08±0.42	64.44%*a
<b>Group IV</b> Vembu karpam	200mg/kg.I.P.	1.95±0.38	66.66%*a

**Figure. 1. Paw volume of anti-inflammatory action of *Vembu karpam***

Data are expressed as Mean ± S.E.M. (n=6)

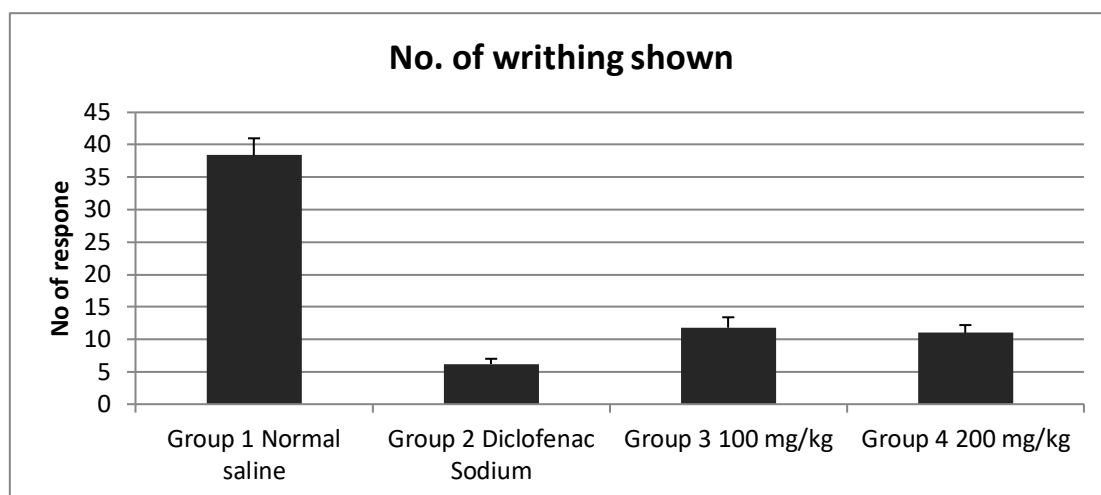
**Figure 2. Percentage reduction of paw volume treated through *Vembu karpam***

**Table No.2 Analgesic activity of *Vembu karpam* by acetic acid induced writhing reflex in mice.**

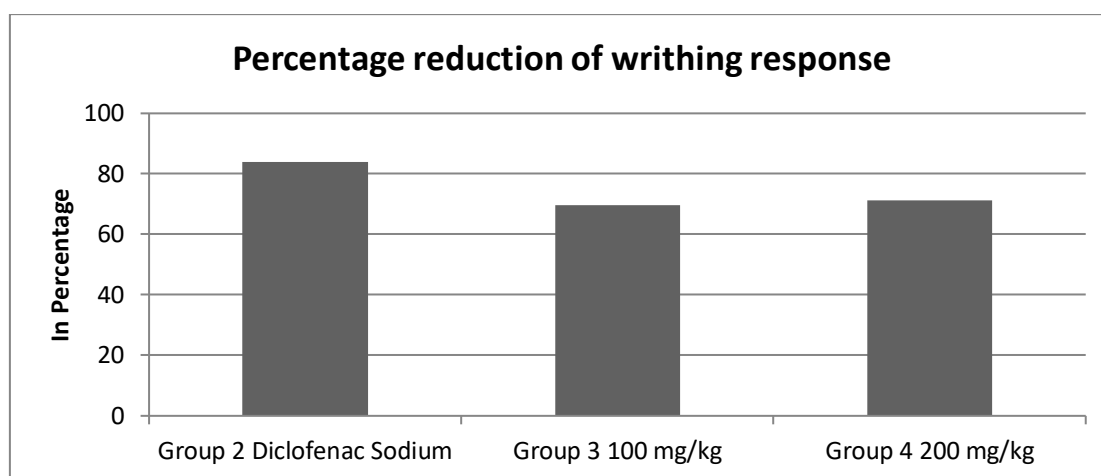
Treatment	Dose (mg/kg)	No. of writhing	% reduction in reaction time
<b>Group I</b> Normal saline	Inject 1% v/v acetic acid 1 ml/100g of body weight	38.4±2.6	-
<b>Group II</b> Std	10mg/kg I.P.Diclofenac sodium	6.2±0.8	83.85%**
<b>Group III</b> Vembu karpam	100mg/kg Administered through orally.	11.8±1.6	69.27%**
<b>Group IV</b> Vembu karpam	200mg/kg Administered through orally	11.0±1.2	71.35%**

Values are expressed as mean±SEM. Values were found out by using one-way ANOVA followed by Newman's keuls multiple range tests. \*\* Values were considered significant at P< 0.01.

**Figure 3. No of writhing response perceived by acetic acid induced analgesic study**



**Figure 4. Percentage reduction of writhing response of *Vembu karpam***



## CONFLICT OF INTEREST

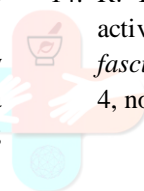
We declare that we have no conflict of interest.

## FINANCIAL SUPPORTS

Nil

## REFERENCES

1. Hasbarinda BintiHasan. Chemical constituents of the twigs of *Mangifera indica*. Indo American journal. Nov 2008:1-3.
2. Ana M. López Mantecón, Gabino Garrido, René Delgado-Hernández and Bárbara B. Garrido-Suárez Combination of *Mangifera indica* Extract Supplementation Plus Methotrexate in Rheumatoid Arthritis Patients: A Pilot Study *Phytother. Res.* 2014; Pages 1163–1172.
3. Roshan Patel, Naveen Mahobia, Nitin Upwar, Naheed Waseem, Hetal Talaviya, Zalak Patel Analgesic and antipyretic activities of *Momordica charantia* Fruits *JAPTR* 2010; Volume: 1 Issue: 4 Page: 415-418.
4. Vaidhyrathnam Ps Varriers, Indian medicinal plants compendium of 500 species, Arya vaidya sala, Kottakkal, 4, 1996, 882.
5. T, Gopal, V, Seethalakshmi S, Chitra K in Vitro Anti Inflammatory and Anti Arthritic Activity of Selected Medicinal Plant *Int. J. Pharm. Sci. Rev. Res.*, 28(2), 2014: Pages: 162-163.
6. Sreeshma PS, Regi Raphael K, Alby Alphons Baby Pharmacognostic Studies of leaves of *Naravelia Zeylanica* (Linn) DC. *South Indian Journal of Biological Sciences* 2016; 2(1): 179-182.
7. Sutharsingh, S. Kavimani, B. Jayakar, M. Uvarani and A. Thangaturupathi Anti Inflammatory and Anti-Arthritic Activities Of Aerial Parts Of *Naravelia Zeylanica* (L)Dc. *IJRPC*, 2011; 1(3): 303-307.
8. P. Khare. Indian Medicinal plants: An illustrated dictionary. Springer Publication, Vol-I, 2008, PP-440.
9. Sapna Phadtare , Rahul Pandit , Vaibhav Shinde , Kakasaheb Mahadik Comparative Phytochemical and Pharmacological Evaluations of Two Varieties of *Ocimum Basilicum* for Antiarthritic Activity *Journal of Pharmacognosy and Phytochemistry* 2013; Vol. 2 No. 2 158-167.
10. Zaveri M, Sunita J. Anti-inflammatory and analgesic activity of root bark of *Oroxylum indicum*. 2010; 2:79–87.
11. Mamatha Karnati, Rodda H Chandra, Ciddi Veeresham, and Bookya Kishan Anti-arthritic activity of root bark of *Oroxylum indicum* (L.) vent against adjuvant-induced arthritis *Pharmacognosy Res.* 2013; 5(2): 121–128.
12. Lalrinzuali, M. Vabeiryureilai, and Ganesh Chandra Jagetia Investigation of the Anti-Inflammatory and Analgesic Activities of Ethanol Extract of Stem Bark of Sonapatha *Oroxylum indicum* In Vivo *International Journal of Inflammation* 2016; Volume 1-8.
13. Londonkar, A. Kamble, and V. C. Reddy, “Anti-inflammatory activity of *Pandanus odoratissimus* extract,” *International Journal of Pharmacology*, 2010; vol. 6, pp. 311–314.
14. R. Kumar, Sanjeeva, D. Padmalaxmi et al., “Antioxidant activity of methanol extract of *Pandanus fascicularis* Lam,” *Journal of Pharmacy Research*, 2011; vol. 4, no. 4, pp. 1234–1236.



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