

ANTI-PYRETIC ACTIVITY OF *PONGAMIA PINNATA*

Jimidi.Bhaskar^{1*}, Venkateshwarlu Goli¹, Sravan Prasad Macharla², N.L Gowrishankar³,
Ch.Dhanalakshmi⁴, Kanakam.Vijay Bhaskar¹

¹Department of Pharmacognosy, Venkateshwara Institute of Pharmaceutical Sciences, Charlapally ,
Nalgonda, Andhra Pradesh, India – 508001

²GBN Institute of Pharmacy, Ghatkesar, RR District, Andhra Pradesh, India.-501301

³Department of Pharmacognosy, Swami Vivekananda Institute of Pharmaceutical Sciences, Bhuvanagiri,
Nalgonda Andhra Pradesh, India – 508001

⁴HITS college of pharmacy,keesara, Bogaram ,Rangareddy Dist.-501301

Abstract: The present study was carried out to investigate the anti-pyretic activity of methanol extracts of *pongamia pinnata* Linn, leaves using experimental animal models. The extracts were screened for alkaloids, steroids, proteins, flavanoids, saponins, mucilage, carbohydrates, tannins, fats and oils. Anti-pyretic activity was evaluated using the brewer's yeast-induced pyrexia in rats. The extracts in dose levels of 100 and 200 mg/kg orally were used for anti-pyretic studies. The methanol extracts of leaves of *pongamia pinnata* produced significant ($P<0.01$) anti-pyretic activity. The 200mg/kg extracts has shown a good anti-pyretic effect ($P<0.01$) with all the doses used when compared to the control group. The results obtained indicate that the crude leaf extracts of *pongamia pinnata* possess potent anti-pyretic activity by supporting the folkloric usage of the plant to treat various diseases.

Key words:, *pongamia pinnata*, Anti-pyretic activity, brewer's yeast induced pyrexia

Introduction

Pyrexia is the same thing as that of fever which is usually 1.8 to 3.6⁰F higher than normal body temperature (or) Anal temperature above 100⁰F¹. It has been used in all most all the traditional system of medicine viz., ayurveda, unani and sidha. From the ancient time the tribal, rural and aboriginal people of our country commonly use this herb in various disorders. Traditionally, herbs used for the treatment of disease and disorders. Diabetic mellitus is a chronic disorder is a major public health problem in the developed as well as developing countries caused by partial or complete insulin deficiency, resulting in hyperglycaemia leading to acute and chronic complications². Synthetic drugs are likely to give serious side effects in addition they are not suitable for intake during conditions like pregnancy³. Most of the Tamil Nadu physicians of Indian system of traditional medicine Ayurveda and Siddha use *Pongamia pinnata* to treat various kinds of diseases including diabetes mellitus⁴. All parts of the plant have been used as a crude drug for the treatment of piles, skin diseases, itches, abscess, painful rheumatic joints wounds, ulcers, diarrhea etc^{5,6}

Materials and Methods

Collection of plant material:

The leaves of the plant *Pongamia pinnata* were freshly collected in venkateshwara institute of pharmaceutical sciences of college medicinal garden, cherlapally, Nalgonda, A.P, India during January-february- 2011. It was authenticated by Prof. Dr.K. Raju, Head of Department of Botany, Kakatiya University, Warangal,A.P, India

Preparation of Extract

The plant materials were washed thoroughly to remove the dirt and shade dried at room temperature. The dried leaves were coarsely powdered (500g) and extracted with methanol using Soxhlet apparatus and concentrated under vacuum to obtain a methanol extract (16.45 %) and the Dilution of the extracts was made in saline for further pharmacological studies.

Experimental animals:

Albino Wistar rats (180-230 g) of either sex were fed with a standard diet and water ad libitum. The animals were housed in spacious polypropylene cages bedded with rice husk. The animal room was well ventilated and maintained under standard experimental conditions (Temperature 27°C and 12 hours light / dark cycle) throughout the experimental period. Animal experiments were carried out following the guidelines of the animal ethical committee of the institute.

Brewer's Yeast induced method for pyrexia

The anti-pyretic activity of the crude extracts of *Pongamia pinnata* was evaluated using Brewer's yeast-induced pyrexia in rats. The initial rectal temperatures were recorded. Fever was induced by subcutaneous injection of 15 % aqueous suspension of sterile Brewer's yeast at a dose of 10 ml/kg b.w. below the nape of the neck. When the temperature was at peak, i.e.24 hr after yeast injection, only rats which developed satisfactory pyrexia (1°C or more increase in rectal temperature) were used. The extract (, methanol extract) were administered to different groups at 100 and 200 mg/ kg i.p. and control group received 0.3 ml of normal saline (5 ml/kg). Paracetamol (150 mg/kg b.w.) served as the reference drug was given orally at 24 hr after the yeast injection. The temperatures were recorded and compared at 1 hr interval after the drug treatment and finally observed the antipyretic activity of different solvent extracts ⁷

Statistical analysis

Data was expressed as mean \pm standard error of mean. . The results were analyzed statistically by ANOVA is followed by Dunnet's test. The result of experiments by proper statistical analysis as stated above are tabulated in table.

Table.1: Antipyretic activity of *Pongamia pinnata*

| Sr. No. | Group | Treatment | Dose | Initial Rectal temp. | 0hr | 1hr | 2hrs | 3hrs |
|---------|-------|----------------------|----------|----------------------|------------------|------------------|------------------|------------------|
| 1 | I | Control | 5ml/kg | 37.64 \pm 0.1 | 40.93 \pm 0.11 | 40.48 \pm 0.17 | 39.21 \pm 0.14 | 39.13 \pm 0.16 |
| 2 | II | Standard Paracetamol | 150mg/kg | 37.21 \pm 0.2 | 40.43 \pm 0.19 | 38.65 \pm 0.17 | 38.46 \pm 0.09 | 37.88 \pm 0.18 |
| 3 | III | Methanolic Extract | 100mg/kg | 37.7 \pm 0.4 | 40.61 \pm .14 | 39.63 \pm 0.19 | 39.13 \pm 0.24 | 38.68 \pm 0.12 |
| 4 | IV | Methanolic Extract | 200mg/kg | 37.32 \pm 0.3 | 40.58 \pm 0.11 | 39.23 \pm .12 | 38.01 \pm 0.14 | 37.93 \pm .16 |

n = 6 in each group, “*” indicate P < 0.01 compared to control

Results and discussion:

Fever may be result of infection or one of the sequels of tissue damage inflammation, graft rejection or other disease states. Anti-pyretic categorized drugs or compounds which have an inhibitory effect on prostaglandin biosynthesis and it does not influence body temperature when it is elevated by factors such as exercise or increases in ambient temperature. Regulation of body temperature requires a delicate balance between production and loss of heat. The hypothalamus regulates the set point at which body temperature is maintained. This set point is elevated in fever^{8,9}. The brewer's yeast induced pyrexia in rats was employed to investigate the anti-pyretic activity of extracts of *Pongamia pinnata*. It was found that the anti-pyretic effect ME was found to be highly significant in maintaining normal body temperature and reducing yeast-induced elevated body temperature in rats in a dose dependent manner and its effect (200mg/kg) is similarly potent to that of the standard anti-pyretic drug paracetamol. This result seems to support the view that the ME extract has some influence on claiming the *Pongamia pinnata* leaves has potent anti-prostaglandin-biosynthesis because prostaglandin is believed to be a regulator of body temperature requires a delicate balance between production and loss of heat and the hypothalamus regulates the set point at which body temperature is maintained¹⁰ However, to know the exact mechanism of action of *Pongamia pinnata* leaf extracts, further study with purified fractions is required.

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