Original Article

Evaluation of AntiPyretic Activity of *Tephrosia purpurea* LINN in Albino Rats

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ABSTRACT

The aim of the present study is to evaluate the antipyretic activity on methanolic plant extract of *Tephrosia pupurea* using yeast induced pyrexia method in albino rats. *Tephrosia purpurea* linn (Family: Fabaceae) is a copiously branched herbaceous perennial plant distributed throughout the tropics and commonly known as *Sarponkha* in India. The results of the statistical analysis showed that methanolic extract of *Tephrosia purpurea* had significant ($p<0.05$) dose dependent antipyretic properties at 250 and 500mg/kg on pyrexia induced by yeast on albino wistar rats. Hence present investigation reveals the antipyretic activity of the methanolic plant extract of *Tephrosia purpurea*.

Keywords: *Tephrosia purpurea*, Antipyretic activity, Methanolic plant extract, Yeast induced pyrexia.

INTRODUCTION

The practice of herbal medicine dates back to the very earliest period of known human history. There is evidence of herbs having been used in the treatment of diseases and for revitalizing body system in almost all ancient civilization[1]. Ayurveda, the Science of Life, has provided a rationale basis for treatment of various ailments. Several plants and their products are claimed and proved to posses' antipyretic property[2].

An antipyretic is a type of medication that will prevent or reduce fever by lowering body temperature from a raised state. They will not affect normal body temperature if the patient does not have a fever. Generally, most non-steroidal anti-inflammatory drugs (NSAIDs) work by inhibiting prostaglandin synthetase within the hypothalamus. Fever, or pyrexia, occurs when the body reaches a temperature above what is considered "average". Bear in mind, however, that this "average" temperature can vary from person to person within certain parameters. It is generally accepted fever exists at a temperature above 37 degrees Celsius when the thermometer is placed under the armpit, or over 37.5 degrees Celsius when measured orally or rectally.

Fever usually results from microbes such as bacteria or viruses triggering the body's defence mechanisms. Antipyretics (literally "against the fire") are drugs that reduce fever[3]. The literature survey also revealed that there are no reports on

correlation between chemical constituents and their pharmacological properties. The present study is therefore undertaken, to study the antipyretic activity of *Tephrosia purpurea*

Tephrosia purpurea linn (Family: Fabaceae) is a copiously branched herbaceous perennial plant distributed throughout the tropics and commonly known as *Sarponkha* in India. According to the Ayurvedic literature the plant is called "*Sarwa wranvishapaka"* which means that it has the property of healing all types of wounds [4]. The plant has been used in the treatment of bronchitis, diuretic, pimples, tonic, laxative, cough and tumour[5]. The leaves are reported to be useful in jaundice[6]. In the present study, antipyretic potential of methanolic extract of plant have been evaluated by comparing with the standard drug paracetamol[7].

MATERIALS AND METHODS

Collection of Plant Materials

The whole plant parts of *Tephrosia purpurea* were collected from surroundings of Nirmala College of Pharmacy, Atmakuru, Mangalagiri, Guntur (Dt), Andhra Pradesh and the same were authenticated by Assistant Professor Dr. S. M. Khasim, Department of Botany, Acharya Nagarjuna University, Guntur A.P., voucher specimen were deposited at Department of Pharmacognosy for further reference.

Method of preparation of methanol extract

For the preparation of extract 100gm of dried coarse powdered leaves were charged in to the soxhlet apparatus (hot extraction) and extracted successively with petroleum ether (600 - 800C), chloroform, ethyl acetate & methanol, in order of their increasing polarity. The successive ethanolic extract (deep brown colour) was filtered & dried under reduced pressure to get a solid mass free from the solvent. The yield was 5.9% with respect to dry starting material with characteristic odour & greasy consistency. The dried extract was dissolved in solution of 2% gum acacia in distilled water (vehicle) for the evaluation of antipyretic activity. Various physico-chemical analyses were performed to identify the chemical constituents[8-9].

Experimental animals

Wistar albino rats weighing between 150-200gm were obtained from Ghosh Enterprises, Kolkata, West Bengal, India. The animals were maintained on the suitable nutritional and environmental conditions throughout the experiment as per the rules and regulations of the institutional animal ethical committee. Experimental protocols for the pharmacological studies were reviewed and approved by the institutional animal ethical committee 1629/PO/a/12/CPCSEA.

Toxicity Study

The selected adult albino rats were used to determine the dose. The animals were divided in to eight groups of six in each. The animals were fasted overnight prior to the acute experimental procedure. The karber's method (Ghosh *et. al*., 2005 & Kale *et. al*., 2005) was used to determine the dose; gum acacia (2% w/v) was used as vehicle to suspend the extracts and administered intraperitoneally. The control group received 2ml/kg of the vehicle intraperitoneally. The other group received the extract as test drug in one of the following doses – 100, 200, 400, 800, 1000, 2000 and 3000mg/kg in a similar manner. Immediately after dosing, the animals were observed continuously for first four hours for behavioral changes and for mortality at the end of 24hrs, 48hrs and 72hrs respectively. The toxicity study showed that the methanolic extract of drug at a minimum dose of 200mg/kg onwards shows the reaction in experimental animals. However, no mortality was reported even after 72hours.

This indicates that the methanolic extract is safe up to a single dose of 3g/kg body weight.

Antipyretic activity[10-14]

Antipyretic activity-yeast induced pyrexia method:

The body temperature of each albino Wistar rats was recorded by measuring rectal temperature at predetermined intervals. Albino wistar rats are grouped into four containing six in each group. The rats are trained to remain quiet in a restraint cage. A thermister probe is inserted 3 to 4 cm into the rectum and fastened to the tail by adhesive tape. Temperature is recorded on a thermometer. After measuring the basal rectal temperature, animals are given subcutaneous injections of 10 ml/kg of 15% w/v yeast suspended in a 0.5% w/v methylcellulose solution. At the 19th hr after yeast injection the rectal temperature of the rats were recorded. After yeast injection the test drug is administered with dose 250, 500 mg/kg to III & IV group animals. Propylene glycol at dose of 5ml/kg was injected to the control group. The II group of rats received the standard drug paracetamol at the dose of 150 mg/kg at the 19th hr after yeast injection. Subcutaneous injection of yeast suspension markedly increased the rectal temperature 19th hr after its administration. Rectal temperature of all the rats was recorded again on the 20th, 21st and 22nd hr after yeast injection.

GROUP-I Control Propylene glycol (5ml)
GROUP-II Standard drug Paracetamol (150mg)
GROUP-III Methanolic extract of *Tephrosia purpurea* (250mg)
GROUP-IV Methanolic extract of *Tephrosia purpurea* (500mg)

Statistical analysis

Data was expressed as mean ± standard error of mean. The results were analyzed statistically by ANNOVA is followed by dunnet's test. The results of experiments by proper statistical analysis as stated above are tabulated in table.

RESULTS & DISCUSSION

Antipyretic potential of plant extract was evaluated by determining its effect on yeast-induced pyrexia in rats. The methanol extract of plant provide moderate to marked anti-pyretic activities, which was also dose-dependent. The result showed methanol extract of different doses caused lowering of the body temperature up to 2 h following its administration. The effect of methanol extract on yeast-induced pyrexia shows that the rectal temperature was markedly elevated to 39.84°C; 18h after the subcutaneous injection of yeast suspension, decreased to 37.90°C within 2hrs of plant extract (500mg/kg) treatment respectively, and was comparable to paracetamol. At 250 and 500mg/kg marked anti-pyretic activity detected which were significantly different than the controls ($p<0.05$). Generally, for all concentration of methanol extract of plant showed marked anti-pyretic activities. This result reveals that methanol extract of *Tephrosia purpurea* have marked antipyretic activity as compare with standard paracetamol.

CONCLUSION

The methanolic extract of whole plant of *Tephrosia purpurea* at a dose of 250mg/kg and 500mg/kg body weight were investigated for antipyretic activity. The methanolic extracts showed potential significant antipyretic activity ($p<0.05$) from 1 hour onwards as compared to the standard drug paracetamol amongst various extracts. The significant antipyretic activity may be due to the presence of flavonoids[15].

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Table 1. Antipyretic effect of methanolic plant extract of *Tephrosia purpurea* on Albino rats

Group	Treatment	Dose	Initial rectal temp. in 0°C	Rectal Temperature in °C after 18hrs hr of yeast injection(Mean±SEM)			
				19th hr	20th hr	21st hr	2nd hr
I	Control propylene glycol	5ml/kg	37.59±0.33	40.93±0.528	40.65±0.149	39.21±0.335	39.13±0.234
II	Standard paracetamol	150mg/kg	37.24±0.05	40.43±0.625	38.65±0.08	38.46±0.56***	37.88±0.07***
III	Methanolic extract	250mg/kg	37.54±0.09	39.84±0.005	38.97±0.003	38.24±0.003**	38.14±0.04**
IV	Methanolic extract	500mg/kg	37.27±0.003	39.77±1.01	38.91±0.02	38.06±0.25***	37.90±0.24***