

ANTIPYRETIC ACTIVITY OF STEM BARK EXTRACT OF *MILLINGTONIA HORTENSIS* LINN

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ABSTRACT

Antipyretic effect of methanolic extract of stem bark of *Millingtonia Hortensis* (L) was evaluated. The extract at doses at 200 and 400 mg / kg. p.o. showed significant reduction in yeast induced hyperpyrexia. The antipyretic effect of extract was comparable to that of paracetamol (150 mg / kg. p.o.).

1. INTRODUCTION

Millingtonia Hortensis (L) commonly known as Indian cork tree, a tall tree upto 24 m. in height, with a straight trunk and an elongated pyramidal crown with deep green foliage, cultivated throughout India for ornament (Anonymous, 1962). The mature stem bark has externally yellowish grey and internally cream colour. Its bark is 1-2cm. thickness and slightly sweet in taste. It has no characteristic odour. Attractive fragrant flowers with white or pinkish colour which appears from September to December, it is also grown as avenue tree (Firminger, 1942). The leaves and barks are used as antipyretic in Indonesia (Benthal, 1946).

The fever associated with infection is thought of result from two actions. The first is the production of prostaglandin in the central nervous system in response to bacterial pyrogens. The second is the effect of interleukin-1 on the hypothalamus. Regulation of body temperature needs a balance between the production and loss of heat and the hypothalamus regulates the set point at which body temperature is maintained. In fever, this set point is elevated and aspirin like drugs promote its return to normal temperature, whereas normal body temperature is only slightly affected these drugs do not influence body temperature when it is elevated by such factors as exercise or increase in the ambient temperature (Katzung, 1998; Gilman, 1996). Search for the plant drugs has been initiated to avoid the side effects of synthetic drugs. So many plants were screened for its antipyretic potential and reported. Based on the traditional use of the plant, an attempt was made to evaluate the methanolic extract of *Millingtonia Hortensis* bark for its antipyretic activity.

2. MATERIALS AND METHODS

Millingtonia Hortensis Linn stem bark were collected from Kompally, Ranga Reddy Dist. of Andhra

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Pradesh, India and identified by Dr. Najma Unnisa, Botanist, Assistant Professor, Sultan – UI – Uloom College of Pharmacy, Hyderabad – 500 034. The bark was dried under controlled temperature, powdered and then passed through 40 mesh sieve.

Extraction procedure: The powdered plant material was extracted with 90% methanol and the solvent was completely removed by vacuum distillation to give a brown residue (yield 8.3% w/w. with respect to dry starting material). Standard phytochemical screening tests were carried out for the methanolic extraction of *Millingtonia Hortensis* bark, according to the methods of Trease and Evans, the presence or absence of various phytoconstituents like sugars, steroids, tannins, flavonoids, glycosides and phenolic compounds, alkaloids were observed by preliminary phytochemical screening (Gamble, 1922).

Animals used: Adult albino rats (Wistar strain) of either sex weighting 180 – 200 g were used. The animals were maintained under suitable nutritional and environmental conditions throughout the experiment. The Animal experiment was approved by Animal ethical committee of the Sultan – UI – Uloom College of Pharmacy, Hyderabad.

Study on normal body temperature: Rats of either sex were divided into four groups, comprising six in each group for this experiment. The body temperature of each rat was measured rectally at predetermined intervals before and for 5 hours after administration of either 2% aqueous Tween 80 solution (control) or *Millingtonia Hortensis* extract at doses of 100, 200 and 300 mg/kg orally.

Induction of yeast induced pyrexia: Rats were divided into five groups (six in each group). The normal body temperature of each rat was measured rectally at predetermined intervals and recorded. Fever was induced as per the method described by Smith and Hamburger (1935), (Saunders, 2002). The rats were trained to remain quiet in a restraint cage.

The temperature was measured with a digital thermometer. After measuring the basal rectal temperature, animals were given subcutaneous injection of 10 ml/kg of 15% w/v yeast suspended in 0.5% w/v methylcellulose solution. Rats were then returned to their housing cages. After 19 hours of yeast injection, the animals were again restrained in individual cages for their rectal temperature to be recorded, as already described.

Drug administration: After 19 hours of the yeast injection, the methanolic extraction of *Millingtonia Hortensis* was administered orally at doses of 100, 200 and 300 mg/kg to three groups of animals, respectively. Similar volume (5 ml/kg) of 2% aqueous Tween 80 solution was administered orally to the control group of animals. The fifth group of animals received the standard drugs, paracetamol (150 mg/kg) orally. Rats were restrained for their rectal temperature to be recorded at the 19th hour, immediately before methanolic extraction of *Millingtonia Hortensis* bark or 2% aqueous Tween 80 suspension or paracetamol administration and again at hour's interval up to 23rd hours after yeast injection.

Statistical analysis: The Rats were analyzed for significance by unpaired two-tailed student's t-test (Woodson, 1987).

3. RESULTS AND DISCUSSION: Effect of methanolic extraction on normal body temperature in rats were shown in table 1. It was found that the extraction showed maximum lowering body temperature at the doses of 200 and 300 mg/kg. in dose dependent manner and it caused significant lowering of body temperature up to 5 hours of its administration.

The subcutaneous injection of yeast suspension markedly elevated the rectal temperature at 19th hour of its administration. Treatment with the methanolic extraction of *Millingtonia Hortensis* bark at the doses 100, 200, and 300 mg/kg. Decreased the rectal temperature of the rats in dose dependent manner. The antipyretic effect started as early as 1 hour and the effect was maintained for 4 hours after its administration. The standard drug paracetamol at 150 mg/kg. dose significantly reduced the yeast provoked elevation of body temperature. The results obtained from both the standard drug treated *Millingtonia Hortensis* bark extraction treated rats were compared with the control (2% aqueous Tween 80 solution) group and observed the significant reduction in the yeast elevated rectal temperature (Table 2). Thus our data suggests that the methanolic extract of *Millingtonia Hortensis* bark has significant antipyretic effect.

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Table 1:

Effect of Methanolic Extraction of *Millingtonia Hortensis* bark on normal body temperature.

Treatment	Rectal temperature (°C) before and after treatment					
	0 h	1 h	2 h	3 h	4 h	5 h
Control 5 ml/kg body wt.	37.4 ± 0.2	37.21 ± 0.1	37.38 ± 0.31	37.12 ± 0.2	37.12 ± 0.1	37.0 ± 0.2
<i>M. Hortensis</i> 100 mg/kg body wt.	37.2 ± 0.1	36.7 ± 0.3*	36.6 ± 0.2**	36.5 ± 0.3**	36.7 ± 0.2**	36.8 ± 0.3
<i>M. Hortensis</i> 200 mg/kg. body wt.	37.3 ± 0.2	36.2 ± 0.1***	36.2 ± 0.2***	36.3 ± 0.2**	36.7 ± 0.2**	36.7 ± 0.2**
<i>M. Hortensis</i> 300 mg/kg. body wt.	37.1 ± 0.2	35.8 ± 0.2***	35.8 ± 0.2***	35.8 ± 0.1***	35.9 ± 0.2***	36.0 ± 0.2**

Each Value represents mean ± SEM (n = 6).

Control = 2% aqueous Tween 80 solution.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, as compared to the control values of corresponding hour.

Table 2:

Effect of Methanolic Extraction of *Millingtonia Hortensis* bark on yeast induced pyrexia in rats

Treatment	Rectal temperature (°C) after yeast injection at					
	0 hr	19 hr	20 hr	21 hr	22 hr	23 hr
Control 5 ml/kg body wt.	37.59 ± 0.02	37.59 ± 0.02	39.49 ± 0.03	39.3 ± 0.07	39.0 ± 0.03	39.05 ± 0.03
Paracetamol 150 mg/kg.	37.9 ± 0.01	39.8 ± 0.03	38.1 ± 0.01***	38.0 ± 0.01***	37.9 ± 0.05***	37.8 ± 0.03***
<i>M. Hortensis</i> 100 mg/kg body wt.	37.4 ± 0.04	39.8 ± 0.01	39.1 ± 0.01**	38.49 ± 0.02**	38.3 ± 0.05**	37.8 ± 0.09**
<i>M. Hortensis</i> 200 mg/kg. body wt.	37.4 ± 0.01	39.8 ± 0.01	38.8 ± 0.05***	38.3 ± 0.05***	37.8 ± 0.08***	37.7 ± 0.06**
<i>M. Hortensis</i> 300 mg/kg. body wt.	37.5 ± 0.07	39.8 ± 0.07***	38.5 ± 0.01***	37.8 ± 0.03***	37.4 ± 0.01***	37.49 ± 0.05***

Each Value represents mean ± SEM of 6 rats.

Control = 2% aqueous Tween 80 solution.

*** $p < 0.001$, ** $p < 0.01$, when compared with the control values of corresponding hour

5. REFERENCES:

- Anonymous, The wealth of India, Raw Material, CSIR, New Delhi, 6, 1962, 380.
- Benthall A.P, The trees of Calcutta and its neighbourhood, Thaker, Spink & Co.Ltd, Calcutta, 1946, 334.
- Firminger T.A, Firminger's Manual of gardening for India, Thaker, Spink and Co.Ltd., Calcutta 8th Edition, 1947, 412.
- Gamble J.S, A Manual of India Timbers, Sampson, Low, Marston & Co.Ltd., London, 1922, 510.
- Saunders, Edinburgh, Tease and Evans pharmacognosy, 2002.
- Woodson R.F, Statistical methods for the analysis of biochemical data, series in probability and mathematical statistics, widely New York, 1987, 315-316.