

ANTIPYRETIC ACTIVITY OF *BLUMEA LACERA* LEAVES IN ALBINO RATS

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ABSTRACT: The present study was carried out to determine the antipyretic activity of the methanolic extract of *Blumea lacera* leaves (BLE) on albino rats. Acute toxicity study of BLE was performed by limit test as per OECD guideline. Antipyretic activity was studied by inducing pyrexia with Brewer's yeast. Acute oral LD₅₀ of BLE in female rats was more than 2000 mg/kg. Three ascending doses of 100 (1/20 LD₅₀), 200 (1/10 LD₅₀) and 400 mg/kg (1/5 LD₅₀) were selected for studying the antipyretic activity of BLE in rats. BLE at dose rates of 200 and 400 mg/kg reduced brewer's yeast induced pyrexia in rats suggesting antipyretic effect of BLE.

KEY WORDS: *Blumea lacera*, Albino rats, Brewer's yeast, Antipyretic.

INTRODUCTION

Blumea lacera of family Asteraceae is a common roadside weed in Asia, Australia and tropical Africa during winter. This plant is commonly known as Kakronda in India. It is an annual herb with strong odour of turpentine or camphor. *Blumea lacera* is considered as a valuable homoeopathic drug beneficial in case of enuresis, neuralgia, headache and cold borne cough (Oudhia *et al.* 1998). This plant is also mentioned as antipyretic, anti-inflammatory, liver tonic, digestive, diuretic and expectorant (Joshi 2000). Similarly, fresh leaf juice is effective in chronic purulent discharge in eyes,

worm infection, dysentery and strong fever (Singh *et al.* 2005). Fresh leaves of *Blumea lacera* are considered to be the most valuable part of the plant (Oudhia and Tripathi 1999) and therefore, the present study was undertaken for evaluating antipyretic potential of alcoholic extract of *Blumea lacera* leaves (BSE).

MATERIALS AND METHODS

Blumea lacera-sample preparation

Fresh leaves of *Blumea lacera* were procured in the month of February-March from the campus of College of Veterinary Science & Animal Husbandry, Durg, India and were

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botanically identified. The leaves were washed and cleaned, then cut into pieces, shade dried and powdered with the help of an electrical grinder. The leaf powder was subjected to continuous extraction for 24 h with hot methanol by using Soxhlet's apparatus. The methanol extract was then filtered and evaporated to dryness under reduced pressure on a rotary evaporator. This hot methanolic *Blumea lacera* leaf extract so obtained, was referred here as "*Blumea lacera* extract" (BLE). Being water insoluble, BLE was dissolved in propylene glycol for administration to albino rats.

Animals

Twenty four young weaned Wistar rats (100-150g) were obtained from a registered laboratory animal breeder. The animals were grouped and housed in polyacrylic cages and maintained in an air conditioned Lab. Animal House attached to the Department of Pharmacology & Toxicology. All animals were fed with standard laboratory animal diet with free access to clean drinking water. The animals were acclimatized to the laboratory conditions for 10 days before commencement of experiment. All the experimental protocol were approved by the Institutional Animal Ethical Committee (IAEC), College of Veterinary Science & AH (Anjora), Durg (CG), India and were in accordance to the guidelines of the CPCSEA, Ministry of Forests and Environment, Government of India.

Acute oral toxicity study

Limit test was performed as per OECD guideline for testing of chemicals (OECD 1998) to evaluate the acute oral toxicity of BLE in female albino rats with the upper limit dose of 2000 mg/kg. The mortality, behaviour and

signs and symptoms of toxicity, if any, were recorded for a period of 14 days of post administration.

Antipyretic activity test

The antipyretic activity of BLE was evaluated using Brewer's yeast-induced pyrexia in male Wistar rats (Loux *et al.* 1972). Rats were randomized into five groups. Fever was induced by injecting 20 ml/kg (s/c.) of 20 per cent aqueous suspension of Brewer's yeast in normal saline below the nape of the neck. Rectal temperature was recorded by clinical thermometer immediately before (-18 h) and 18 h after (0 h) Brewer's yeast injection and subsequently at 1, 3 and 6 h of post drug/extract administration.. The pyrexia of each rat in Groups was determined from the difference between 0 h and -18 h body temperature. Body temperature taken at 0 h served as the pre - drug pyrexia. The per cent inhibition in pyrexia was determined at different post-treatment intervals with compare to control group. Paracetamol @ 100 mg/kg p.o. was used as standard drug to compare the antipyretic action of BLE.

STATISTICAL ANALYSIS

Data were expressed as mean \pm SE. The results were analysed by one-way ANOVA followed by Dunnett's t test.

RESULTS

Acute oral toxicity study

No death was recorded, and it is established that oral LD50 of the BLE was more than 2000 mg/kg. Based on acute toxicity study, one-fifth of the limit dose (400 mg/kg) was considered as the maximum effective oral dose for this study and other two doses of BLE *viz.* 100 and

200 mg/kg were selected for pharmacological screening.

Antipyretic Activity

The experimental rats showed a mean increase of about 2.22 °C in rectal temperature 18 h after Brewer's yeast injection. BLE at 200 and 400 mg/kg produced significant ($P < 0.05$ and $P < 0.01$ respectively) antipyretic activity at 1, 3 and 6 h after drug administration, whereas BLE (100 mg/kg) failed to reveal significant antipyretic effect at any time post-treatment. The antipyretic effect of BLE at 400 mg/kg, was comparable to that of reference drug- paracetamol (100 mg/kg) (Table 1).

DISSCUSION

The pyrogens activate the enzyme cyclooxygenase (COX), which converts arachidonic acid to prostaglandin by formation of cytokines such as interleukins, interferons and tumor necrosis factor (Kinsella *et al.* 1990). In these events, synthesis of PGEs, especially PGE1 is observed to be increased in the hypothalamus. Antipyretics compete with arachidonic acid at the active site of COX, inhibiting the synthesis of PGE1 (Insel 1996). *Blumea lacera* has also been reported to be traditionally used in the treatment of pain and fever (Kirtikar and Basu 1975) which seemed

Table 1. : Effect of BLE on Brewer's yeast -induced hyperpyrexia in rats. Mean rectal temperature \pm SE ($^{\circ}$ C) (Mean with SE of 6 replicates)

Group	Treatment	Mean Rectal Temperature ($^{\circ}$ C) \pm SE				
		Before drug Treatment		After drug Treatment		
		-18 h (A)	0 h (B)	1h (C1)	3h (C2)	6h (C3)
I	Brewers yeast (BY)	37.18 \pm 0.13	39.33 \pm 0.28	39.28 \pm 0.27	39.38 \pm 0.15	39.40 \pm 0.10
II	BLE @ 100mg/kg	37.37 \pm 0.13	39.68 \pm 0.07	39.33 \pm 0.08 (15.0)	39.27 \pm 0.11 (18.7)	39.23 \pm 0.17 (21.2)
III	BLE @ 200mg/kg	37.38 \pm 0.15	39.66 \pm 0.20	38.87* \pm 0.17 (34.6)	38.63* \pm 0.14 (45.4)	38.77* \pm 0.19 (39.0)
IV	BLE @ 400mg/kg	37.48 \pm 0.07	39.56 \pm 0.08	38.31** \pm 0.12 (60.0)	38.06** \pm 0.23 (72.1)	38.23** \pm 0.21 (63.9)
V	Paracetamol @ 100mg/kg	37.40 \pm 0.12	39.70 \pm 0.13	38.01** \pm 0.07 (73.9)	37.80** \pm 0.13 (82.6)	37.73** \pm 0.15 (85.50)

* $p < 0.05$ and ** $p < 0.01$ compared to BY control. (n=6)
 Figures in parentheses indicate per cent decrease in pyrexia.

to be justified in this study. Presence of flavonoid, β -sitosterol and triterpenes compounds was reported in the leaves of *Blumea lacera* (Agrawal *et al.* 2007) These compounds are known to inhibit the enzyme prostaglandin synthetase, hence produces significant antipyretic effects (Beirith *et al.* 1999).

CONCLUSION

The promising antipyretic activity of BLE warrants further studies to establish its clinical usefulness in the alleviation of febrile conditions in man and animals.

ACKNOWLEDGEMENT

The authors are thankful to Dean, College of Veterinary Science and Animal Husbandry, Anjora, Durg, CG, India for providing necessary facilities to carry out this research work.

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