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EVALUATION THE EFFECT OF AQUEOUS EXTRACT OF *DOLICHANDRONE FALCATA* USING YEAST-INDUCED HYPERTHERMIA IN RATS

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ABSTRACT

The aim of present study was to investigate the antipyretic effect of aqueous extract of stem bark of *Dolichandrone falcata* using Brewer's yeast induced hyperpyrexia method in Wistar strain albino rats. This is being carried out with the intention of giving a scientific validity and justification of such herb indicated for the treatment of pyrexia. At a dose of 200mg/kg & 400mg/kg of aqueous extract of stem bark of *Dolichandrone falcata* were showed a significant ($P<0.01$) dose dependent antipyretic effect in yeast induced elevation of body temperature in experimental rats. The results showed that the extract contains some pharmacologically active principles and lend pharmacological credence to the ethnomedical use of the plant in the management of pyrexia and it shows significant antipyretic activity when compared with the standard drug.

Keywords: *Dolichandrone falcate*, Brewer's yeast, Pyrexia, Antipyretic activity.

INTRODUCTION

Dolichandrone falcata Seem., Bignoniaceae, is a small deciduous tree with bluish grey bark, peeling in irregular woody scales and also commonly known as Medshingi. It is growing on hedges of cultivated fields and frequently in hill forest, occasionally seen in dry scrub forests. *Dolichandrone falcata* bark is traditionally used in the treatment of fractured bones and used as a fish poison. In this plant Chrysin (flavone) was identified and reported for different biological activities such as anti-oxidant, anti-allergic, anti-inflammatory, anti-cancer, antiestrogenic and anxiolytic activities by previous authors [1-7]. In Ayurveda, the stem bark of *Dolichandrone falcata* is used for cure the ulcer, pain and epilepsy. But still no depth scientific study has been performed on *Dolichandrone falcata* stem - bark pharmacological properties. The aim of present study was to investigate the antipyretic effect of aqueous extract of stem bark of *Dolichandrone falcata* using Brewer's yeast induced hyperpyrexia method in Wistar strain albino rats. This is being carried out with the intention of giving a scientific validity and justification of such herb indicated for the treatment of pyrexia.

MATERIALS AND METHODS

Plant collection and Preparation of plant extract

The stem-bark of *Dolichandrone falcata* was collected from the forest of Agasthyamalai hills, Tirunelveli district, Tamilnadu, India. It was identified and authenticated by Dr.V.Chelladurai, Research Officer Botany. C.C.R.A.S., Govt. of India. The collected stem-bark of *Dolichandrone falcata* was shadow/air dried in room temperature without sunlight. The dried material was extracted in 1 litre of boiling water for 2-3 h and concentrated to half of the volume by boiling in a water bath. The yielded brownish extract was cooled and filtered

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using Whatman filter paper. The filterate extract was concentrated up to 100 ml on rotavapour under reduced pressure. The yield value was found to be 12.5%. The concentrated plant extract was lyophilized into powder used for the further pharmacological study which is suspended to 1% tween 80.

Animals

Albino Wistar strain of rats, weighing about 180-220 g were obtained from Department of Pharmacology, Southern Institute of Medical Sciences, Guntur. Andhra Pradesh, India and used for the screening models. According to guidelines, animals were kept in animal house at an ambient temperature of 25°C and 45–55% relative humidity, with 12 h each of dark and light cycles. Animals were complete fed pellet diet and water *ad libitum*. For screening anti-ulcer efficiency purpose the animals were kept fasting overnight but were allowed free access to water. The experimental protocol was approved by the Institutional animal ethical committee.

Antipyretic studies (Brewer's yeast induced hyperpyrexia method)

Animals of either sex were divided in to four groups containing six in each group for this experiment. The normal body temperature of each rat was measure rectally at one hour interval on a thermometer and recorded. The antipyretic activities of extract were evaluated using Brewer's yeast induced pyrexia in Wistar rats [8]. Before yeast injection the basal rectal temperature of rats was recorded and after recording animals were given subcutaneous injection of 10 ml/ kg of 15 % w/v yeast suspended in 0.5 % w/v methyl cellulose solution for elevation of body temperature of rats. Rats were then returned to their housing cages. At the 18hrs after yeast injection, the vehicle, standard drug and test drugs were administered in to different groups. 1% tween 80 at dose of 5 ml/kg was administered orally to the control groups of animals and Paracetamol at dose of 150mg/kg was administered orally to standard group of animals. The aqueous extract of *Dolichandrone falcate* stem-bark was administered orally at a dose of 200 mg/kg and 400 mg / kg of body weight to two groups of animals respectively. Rectal temperature was recorded by clinical thermometer at 0,1,2 3rdhrs after drug administration and tabulated in table 1 [9].

Statistical analysis

Data was expressed as mean ±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 is tabulated in table 1.

RESULTS

Anti-pyretic activity

The effect of aqueous extract of *Dolichandrone falcate* plant on yeast induced pyrexia has been shown in table 1. Treatment with extracts at dose of 200 mg/kg and 400 mg/kg body weight and Paracetamol at dose of, 150mg/kg decreased body temperature of yeast induced rats. The results obtained from both standards and extracts treated groups were compared with the control group. A significant reduction in the yeast elevated rectal temperature was observed in the test drug.

Table 1. Antipyretic effect of aqueous extract of stem-bark of *Dolichandrone falcate* on wistar albino rats

S. No	Group	Treatment	Dose	Initial Rectal Temp. in 0C Before Yeast Injection	Rectal Temperature in ^{0}C after 18hrs of Yeast Injection(Mean± SEM)			
					0hr	1hr	2hr	3hr
1	I	Control	5ml/kg	37.82 ± 0.12	40.32 ± 0.15	40.52 ± 0.14	39.25 ± 0.12	39.19 ± 0.2
2	II	Standard paracetamol	150mg/kg	37.52 ± 0.21	40.16 ± 0.10	38.44 ± 0.11	38.72±0.15*	37.12 ± 0.17*
3	III	AEDF	200mg/kg	37.64 ± 0.34	40.33 ± 0.22	39.42 ± 0.10	39.28 ± 0.21	38.57 ± 0.31
4	IV	AEDF	400mg/kg	37.42 ± 0.21	40.18 ± 0.12	39.14 ± 0.21	38.62±0.20*	37.54 ± 0.10*

DISCUSSION AND CONCLUSION

Fever may be due to infection or one of the sequele of tissue damage, inflammation, graft rejection, or other disease states. Antipyretic are the agents, which reduce the elevated body temperature. Regulation 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 maintained. In fever this set point elevates and a drug like paracetamol does not influence body temperature when it is elevated by the factors such as exercise or increase in ambient temperature. Yeast induced fever is called pathogenic fever. Its etiology includes production of prostaglandins, which set the thermoregulatory center at a lower temperature. The present results show that AEDF possesses a significant antipyretic effect in yeast-provoked elevation of body temperature in rats, and its effect is comparable to that of paracetamol (standard drug). So inhibition of prostaglandin synthesis could be the possible mechanism of antipyretic action as that of paracetamol.

Also, there are several mediators or multi processes underlining the pathogenesis of fever. Inhibition of any of these mediators may bring about antipyretic effect [10-13].

The present investigations it may be concluded that the aqueous extract of *Dolichandrone falcata* stem-bark have antipyretic activity. Further, study regarding isolation and characterization of active principle responsible for antipyretic activity are under planning in our laboratory.

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