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Evaluation of antipyretic activity of leaf extracts of *Triumfetta rhomboidea* Jacq

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ABSTRACT

A study was carried out to evaluate the anti-pyretic potential of the ethanol extract of *Triumfetta rhomboidea* leaves using Yeast induced pyrexia in wister albino rats. Rectal temperatures were recorded before and after inducing pyrexia at interval of one hour for three hours. The leaf extract at oral doses of 100 and 200 mg/kg showed significant reduction in yeast-provoked elevated temperature in a dose-dependent manner and the anti-pyretic effect was comparable to that of standard antipyretic agent paracetamol (200 mg/kg). The effect also extended up to 3 hours after the drug administration.

Keywords: *Triumfetta rhomboidea*, antipyretic activity, yeast-induced pyrexia model.

INTRODUCTION

Triumfetta rhomboidea Jacq (Synonyms: Triumfetta bartramia Linn) belonging to family Tiliaceae is widely distributed in tropical and subtropical part of India up to an elevation of 1,200 m in the Himalayas. It is also available in Ceylon, Malay, China, Africa and America. The roots of the plant traditionally used for the treatment of intestinal ulcer, dysentery and as diuretic. Leaves & Stem are used in tumors, gonorrhoea and leprosy. It is also indicates that the Zulu women take a hot infusion of the root to facilitate childbirth or to hasten the inception of parturition when it is delayed.[1-3] Since no information is available on anti-pyretic activity of *Triumfetta rhomboidea* leaves, the present study was undertaken to investigate the anti-pyretic activity of *Triumfetta rhomboidea* leaves.

MATERIALS AND METHODS

The leaves of *Triumfetta rhomboidea* was collected from Yercaud, Salem district, Tamilnadu and authenticated by Botanical survey of India at Coimbatore. Leaves were dried under shade, coarsely powdered and stored in airtight container for further use.

Preparation of extract

The powdered plant materials were extracted using ethanol as solvent in a Soxhlet apparatus and after complete extraction (48 hr) the solvent was

removed by distillation under reduced pressure and resulting semisolid mass was vacuum dried using rotary flash evaporator to yield (12.0% w/w) a solid residue. [4, 5]

Animals used

Wistar albino rats of either sex weighing 250-300 g were used. The animals were maintained under suitable conditions (Temperature 25±2°C) with dark and light cycle (14/10 hrs), and fed with standard dry pellets and water *ad libitum* throughout the experiment. The experiment was initiated after approval of Institutional Animal Ethical Committee [(IAEC- Reg. no 887/ac/05/CPCSEA].

Toxicity study

Acute toxicity for the determination of LD50 value was performed with different doses of the extract. They were observed continuously for the first 2 h for toxic symptoms and up to 24 h for mortality.[6,7] In acute toxicity study the given extract did not show any mortality up to the dose of 2000 mg/kg.

Treatment Protocol

The anti-pyretic activity was screened by using yeast induced hyper pyrexia method. Albino rats of either sex were selected and divided into four groups each having four animals. After recording basal temperatures, fever was induced in rats by injecting 20% aqueous suspension of Brewer's yeast in normal saline by subcutaneous injection. After 18 hours of yeast injection, the extract in the doses of 100 and 200mg/kg was administered orally to Group III & IV as a suspension in 0.5% CMC solution. Group II was administered with paracetamol (200mg/kg) and the control group (Group I) was given 0.5ml of 0.5% CMC solution. The rectal temperature was measured at different time intervals by using digital thermometer. [8, 9]

Statistical analysis

The data were statistically analyzed using Turkey-Kramer Multiple Comparisons Test. All data were represented as mean ± SD.

Table – 1: Anti-pyretic activity of ethanol extract of *Triumfetta rhomboidea* (EETR) on yeast induced pyrexia method

Group	Treatment mg/kg	Initial temp.(°C)	Temp.after 18hrs of yeast admin. (°C)	Reduction in temp. (°C)			Reduction in temp. (°C) at the end of 3hr
				1 hr	2 hr	3 hr	
Control CMC	0.5 ml	37.10±0.06	38.00±0.10**	38.21±0.13***	38.24±0.13***	38.10±0.22***	_
Paracetamol	200	37.20±0.07	38.20±0.07***	37.70±0.12*	37.49±0.13	37.30±0.11	0.90
EETR	100	36.96±0.15	37.85±0.18**	37.80±0.19**	37.50±0.11	37.26±0.06	0.59
EETR	200	37.32 ±0.11	38.25±0.10***	37.96±0.12*	37.82±0.12	37.50±0.14	0.75

Values represents Mean ± S.E.M (n = 4)

EETR – Ethanolic extract of *Triumfetta rhomboidea*.

***P<0.001, **P<0.01, *P<0.05, significant as compared to corresponding data of the control.

RESULTS

In acute toxicity study, the extract was found to be safe and no mortality was observed to a dose as high as 2 g/kg body weight. The ethanolic extract of *Triumfetta rhomboidea* at a dose of 200 mg/kg body weight has shown significant (*P*<0.001) antipyretic activity, it has shown significant fall in body temperature up to 3h following its administration. The average temperature was reduced with the test compound, the reduction being 0.59 and 0.75ºC compared to 0.90ºC with paracetamol standard antipyretic drug and control.

Based on the result of the present study it can be concluded that the ethanolic extract of *Triumfetta rhomboidea* has potential dose - dependant antipyretic activity, it may due to active principles present in this extract.

DISCUSSION

Fever may be due to infection or one of the sequele of tissue damage, inflammation, graft rejection, or other disease states. Antipyretic are 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. [10] Yeast-induced fever is called pathogenic fever. Its etiology includes production of prostaglandins, which set the thermoregulatory center at a lower temperature. [11] The present results show that ethanolic extract of *Triumfetta rhomboidea* 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. [12] Also, there are several mediators or multi-processes underlining the pathogenesis of fever. Inhibition of any of these mediators may bring about antipyresis. [13] The results clearly indicate that the leaves extract of *Triumfetta rhomboidea* in context of antipyretic activity. The detailed study is required in order to identify the actual active constituent from this drug.

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