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Antipyretic Activity of Ethanol Extract of *Cansjera rheedii* J. Gmelin (Opiliaceae)

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Abstract: The antipyretic activity of ethanol (95%) extracts of *Cansjera rheedii* J. Gmelin aerial parts of the plant was evaluated against brewer's yeast-induced pyrexia in rats to assess their antipyretic activity. Rectal temperatures were recorded before and after inducing pyrexia at interval of one hour to five hours. At the same time parallel experiments were run with a standard antipyretic paracetamol (100 mg kg⁻¹) and control (Normal Saline 5 mL kg⁻¹). Ethanol extract of *Cansjera rheedii* J. Gmelin at dose of 250 mg and 500 mg kg⁻¹ body weight showed the antipyretic activity significantly (p<0.001) compared to that of control.

Key words: *Cansjera rheedii*, paracetamol, antipyretic activity

INTRODUCTION

In traditional medicines, various herbal preparations are being used for treating rise in body temperature. In order to reduce the side effects in modern medicine, efforts are being made to find out suitable herbal drugs. In earlier study, we have reported the antipyretic activity of *Toddalia asiatic* Linn (Ruckumani *et al.*, 1996). The present study was taken up to evaluate the effect of ethanol extract of aerial parts of the plant *Cansjera rheedii* J. Gmelin against brewer's yeast-induced pyrexia.

Cansjera rheedii (Family:Opiliaceae) is a climbing shrub, sometimes armed, commonly known as Kalimanakeerai in Tamil is generally found in India through Malaya to Hong Kong and North Australia (Gamble, 1981; Matthew, 1991). The whole plant of *C. rheedii* was used for the treatment of post-natal pain (Ravikumar and Vijaya Sankar, 2003). Hepatoprotective effect (Mounnissamy *et al.*, 2008) and cytotoxic effect (Mounnissamy *et al.*, 2007) of the plant were also reported. The tribes of Nilgiris in Tamil Nadu, India using the plant extract for the treatment of intermittent fever (Hosagoudar and Henry, 1996). So, the present study is focused to establish a scientific evidence for its antipyretic activity.

MATERIALS AND METHODS

Materials

The aerial parts of the plant of *Cansjera rheedii* (Opiliaceae) were collected in and around Auroville, Puducherry in the month of June 2006 and it was identified and authenticated by Auro Herbarium Sakthi Botanical Survey Department, Auroville. A voucher specimen has been kept in our

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laboratory for future reference (VS-12). The aerial parts of the plants of *Cansjera rheedii* were cut into small pieces, shade dried and powdered. The coarse powder was subjected to continuous hot extraction in a Soxhlet by using ethanol (95% v/v). The ethanol was removed by distillation under reduced pressure. This extract was dissolved in Normal Saline (0.9% w/v Sodium Chloride) and used for the experiment.

Animals

Adult male Wistar rats weighing between 150-175 g were procured from Adhiparasakthi College of Pharmacy, Melmaruvathur, Chengalpattu district, Tamil Nadu, South India. They were fed on commercial diet (Hindustan Lever Ltd., Bangalore) and water *ad libitum*. All the animals acclimatized for a week before use. The room temperature was maintained at $25\pm 1^\circ\text{C}$.

Toxicity Study

The LD_{50} value of ethanol extract of *C. rheedii* was determined by using different doses of the extract according to the up and down method (Ghosh, 1984).

Antipyretic Activity

Antipyretic activity of drug was measured by the method described by Smith and Hamburger (1935). The normal body temperature of each rat was measured rectally by using digital thermometer (Make-SK-1250MC, Sato Keiryoki Mfg. Co. Ltd., Japan) and recorded. Pyrexia was induced by subcutaneous (SC) injection of 20% w/v brewer's yeast suspension (20 mL kg^{-1}) into the animals back below the nape of the neck region. The site of injection was massaged in order to spread the suspension beneath the skin. The room temperature is kept at $25\pm 1^\circ\text{C}$. Immediately after yeast administration, food is withdrawn. Eighteen hours after post challenge, the rise in rectal temperature of each rat was measured using digital thermometer. The measurement is repeated after 30 min. Only rats that showed an increase in rectal temperature of at least 0.7°C were selected for the study and were divided into four groups (1-4) comprising each of 6 animals. The Group 1 served as control and received 5 mL kg^{-1} of normal saline orally. Groups 2 and 3 treated with ethanol extract of *Cansjera rheedii* orally at a dose of 250 and 500 mg kg^{-1} , respectively and Group 4 were treated with paracetamol (100 mg kg^{-1} orally) as reference drug. The rectal temperature was measured by digital thermometer at an interval of 1, 2, 3, 4 and 5 h, after test extract/reference drug administration.

Statistical Analysis

The data are expressed as Mean \pm SEM and were analyzed statistically by one-way Analysis of Variance (ANOVA) test between two groups; control and test groups, followed by student's t-test. Significant levels were at $p < 0.001$.

RESULTS AND DISCUSSION

The LD_{50} study showed that the extract was safe at dose of 2 g kg^{-1} body weight. The ethanolic extract at a dose of 250 mg and 500 mg kg^{-1} body weight has shown significant ($p < 0.001$) antipyretic activity, it has shown significant fall in body temperature up to 5 h following its administration. The antipyretic activity started as early as 1 h and the effect was maintained for 5 h. The response was comparable to that of paracetamol a standard antipyretic drug (Table 1).

Fever may be due to infection or one of the sequels 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

Table 1: Effect of ethanolic extract of *C. rheedii* on yeast-induced pyrexia in rats

		Rectal temperature (°C) before and after treatment						
		Before treatment (h)			After treatment (h)			
Treatments	Dose (mg kg ⁻¹)	0	18	1	2	3	4	5
Control (saline)	5 mL kg ⁻¹	37.6±0.03	39.1±0.30	39.1±0.20	39.1±0.20	39.1±0.30	39.1±0.30	39.0±0.20
Ethanolic extract of <i>C. rheedii</i>	250	37.6±0.03	39.7±0.03	38.2±0.06*	38.1±0.06*	38.0±0.04*	38.0±0.04*	37.8±0.04*
Ethanolic extract of <i>C. rheedii</i>	500	37.6±0.04	39.6±0.04	38.1±0.04*	38.1±0.06*	38.1±0.06*	37.9±0.06*	37.9±0.08*
Paracetamol	100	37.6±0.03	39.5±0.03	38.3±0.05*	38.3±0.05*	38.1±0.05*	37.9±0.07*	37.8±0.10*

N = 6 animals in a group, Values are expressed as Mean±SEM, *p<0.001 vs control, data were analyzed by using one way ANOVA followed by student's t-test

factors such as exercise or increase in ambient temperature (Hullatti and Sharada, 2007). Yeast-induced fever is called pathogenic fever, its etiology includes production of prostaglandins, which set the thermo regulatory center at a lower temperature (Howard, 1993). The results show that ethanolic extract of *C. rheedii* 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 (Chandrashekar et al., 2002). Also, there are several mediators or multi-processes underlining the pathogenesis of fever. Inhibition of any of these mediators may bring about antipyresis (Akio et al., 1988). From the above study we have concluded the antipyretic activity of the plant *Cansjera rheedii* J. Gmelin (Opiliaceae). Fractionation of the extract to find out its chemical nature and also to elucidate the probable mechanism of action of antipyretic activity.

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