

ANTIPYRETIC ACTIVITY OF LEAVES OF *CADABA FRUTICOSA* (L.) DRUCE

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Summary

This study was carried out to evaluate the antipyretic potential of aqueous and ethanol extracts of *Cadaba fruticosa* (L.) Druce leaf, a wasteland plant, on normal body temperature and yeast induced pyrexia in Wistar albino rats. The aqueous and ethanol extracts showed significant reduction in normal body temperature and yeast induced pyrexia at 500 mg/kg body weights at 23rd hour of administration of yeast when compared to the standard antipyretic drug paracetamol (45 mg/kg, p.o.) The dose of 100 mg/kg of both the extracts produced less significant antipyretic effect.

Keywords: *Cadaba fruticosa*, Yeast induced pyrexia, antipyretic activity.

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Introduction

Cadaba fruticosa (L.) Druce (Capparaceae) is a shrub growing up to 3 m tall. The plant is used for the treatment of syphilis, sores and as an antiphlogistic, deobstruent, emmenagogue, anthelmintic etc (1). Leaves of *C. fruticosa* 2005 reported to possess antimicrobial activity (2). Cadabalone, cadabicine were isolated from the leaf part of the plant (3). The leaves of this plant are used in traditional medicine to treat various ailments. In order to substantiate the folklore claims, the current study was undertaken to evaluate the antipyretic effect of the leaf extracts in rats.

Materials and methods

Plant Material and extraction

The leaves of *C. fruticosa* were collected from Thiruvarur district in Tamil Nadu, India during March 2005. According to the Flora of Presidency of Madras the plant was identified as *C. fruticosa* and deposited at the department of Pharmacognosy, M.S.Ramaiah College of Pharmacy, Bangalore, India.

Preparation of extract

Shade dried leaves were pulverised to #40mesh size. The powdered leaves were subjected to exhaustive soxhletion with ethanol and solvent eliminated under reduced pressure. It is concentrated to a semisolid residue (Yield 7.04% w/w).

The marc obtained from the above extraction is dried in oven and subjected to maceration with 80°C distilled water for 24h. It was evaporated to dryness to get a semisolid residue (Yield 8% w/w). Both the extracts were subjected to phyto chemical screening.

Aqueous and alcoholic extracts were stored in a desiccator and used for the experimental studies after dissolving it in distilled water (stock solution 200mg/ml). The specific doses administered as described later.

Animals used

Albino rats (wistar strain) of either sex weighing about 180-200g were used in this study. The animals were kept in the standard metabolic cages in groups of six per cage, with free access to standard diet and water *ad libitum*. They are maintained at room temperature under suitable nutritional and environmental conditions throughout the experiment. The

Institutional Animal Ethics Committee reviewed the entire animal protocols prior to conducting the experiments.

Antipyretic Evaluation

Yeast induced pyrexia was used to evaluate the antipyretic activity of the extract. The rats were divided into six groups of six animals and the body temperature of each rat was recorded by measuring rectal temperature at predetermined time intervals. Fever was induced by injecting 15% suspension of Brewer's yeast (*Saccharomyces cerevisiae*) (4, 5, 6). In brief, the rats were allowed to remain quiet in the cage for sometimes. A thermistor probe was inserted 3-4cm deep into the rectum, after fastened the tail, to record the basal rectal temperature. The animals were then given a subcutaneous injection of 10ml/kg of 15% w/v Brewer's yeast suspended in 0.5% w/v methyl cellulose solution and the animals were returned to their housing cages. Nineteen hour after yeast injection, the rats were again restrained in individual cages to record their rectal temperature. Immediately the aqueous and alcoholic extracts were administered orally at doses of 100 and 500 mg/kg to the first four groups of animals, the fifth group received distilled water and sixth group received 45 mg/kg of paracetamol as drug control. Rectal temperature of all the rats was recorded at 19h immediately before, extract, vehicle or paracetamol administration and again at 1h interval up to 23h after yeast injection (7).

Statistical analysis

The data are expressed as mean \pm standard error of the mean (SEM). Significance was evaluated by student's t-test (8). P-values less than 0.05 imply significant.

Results

On phytochemical screening alcoholic extract indicated the presence of alkaloids, tannins, lactones, steroids and flavonoids whereas aqueous extract showed the presence of alkaloids, flavonoids, phytosterols and tannins.

The subcutaneous injection of yeast caused a marked increase in rectal temperature at the 19th hour of administration. The effect of aqueous and alcohol extracts of *C. fruticosa* on yeast-induced pyrexia is presented in Table-1.

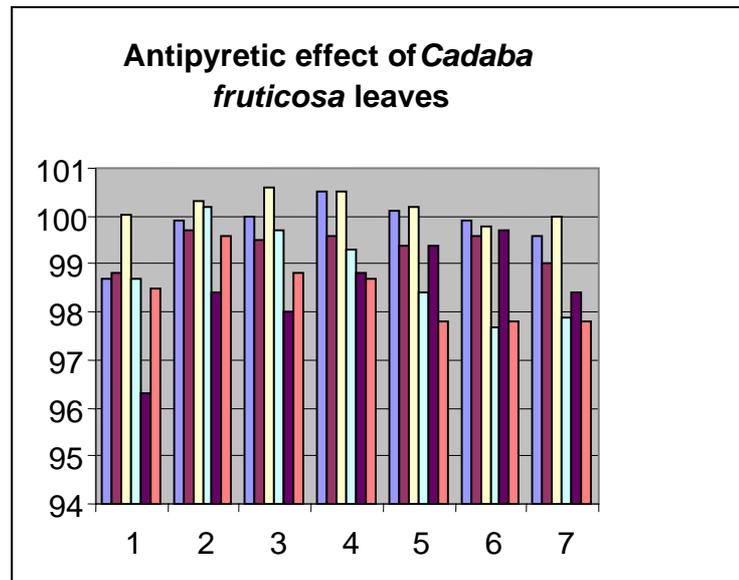
The data revealed that aqueous and alcohol extracts at the dose of 100 mg/kg caused a significant reduction of body temperature up to 4h after administration. However, the effect increases very significantly for both the extracts at doses of 500 mg/kg until the fifth hour after administration. The antipyretic effect was comparable with that of the standard paracetamol.

Table 1

Effect of *C. fruticosa* extracts on yeast induced pyrexia in rats

S.No	Treatment	Rectal temperature (F) (mean SEM) after yeast administration						
		Basal	0h	19.5h	20h	21h	23h	25h
1.	100mg aq.extract	98.78±0.36	99.9±0.36	100±0.24**	100.5±0.40	100.1± 0.44	99.9±0.45	99.6±0.36
2.	500mg aq.extract	98.8±0.30	99.7±0.37	99.5±0.34	99.6± 0.36	99.4±0.44	99.6±0.43	99 ±0.22
3.	100mg alcohol extract	100.01±0.27	100.38±0.3	100.6±0.32***	100.5±0.32	100.2±0.32	99.8±0.32	100± 0.23*
4.	500mg alcohol extract	98.72±0.20	100.21±0.2	99.7 ± 0.15*	99.3± 0.38	98.4 ± 0.32	97.7±0.57*	97.9± 0.65
5.	control	96.3±0.50	98.4±0.67	98 ± 0.72	98.8±0.78	99.4± 0.58	99.7±0.62	98.4± 0.3
6.	Paracetamol 45mg/Kg	98.56±0.02	99.6±0.18	98.8 ± 0.28	98.7± 0.27	97.8±0.24	97.8±0.27	97.8±0.14

* p < 0.05 ** p < 0.01 *** p < 0.001



- 100mg aq.ext.
- 500mg aq.ext.
- 100mg alc.ext.
- 500mg alc. ext.
- Control
- Paracetamol

Discussion

Fever may occur due to an external manifestation of some tissue damage, graft rejection, inflammation or bacterial infections caused by *Staphylococcus aureus*. Drugs having CNS depressant activity demonstrate a potent hypothermic effect (9). According to Guyton potent antipyretics such as paracetamol, nimuselide etc., have toxic effect to the various organs of the body (10). The body's ability to maintain a natural balance of cox 1 and 2 that regulate inflammatory response play a crucial role in supporting cardiovascular, immune, neurological and joint and connective tissue system (11). A number of plant extract modulate enzymes of cyclo oxygenase pathway, as reported with *Rosmarinum officinalis*, eugenol of *Ocimum sanctum* similar to aspirin, ibuprofen and naproxen (12).

Conclusion

The results showed that the alcohol extract of *C. fruticosa* possess a significant antipyretic effect in yeast-induced pyrexia at the dose level of 500 mg/kg. Its effect is comparable to that of standard antipyretic drug paracetamol. Nevertheless, aqueous extract of *C. fruticosa* at both dose levels (100 and 500 mg/kg) produced less significant antipyretic effect. The antipyretic effect of extracts may be due to the inhibition of cox 1 and 2 or due to CNS depressant activity. However, to know the exact mechanism of action and the phytoconstituent responsible for the action further studies with isolation of components are warranted.

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