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Research Article

Antipyretic Activity of *Zizyphus jujuba* lam. Leaves

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ABSTRACT

The anti pyretic activity of *Zizyphus jujuba* Lam. was evaluated to Brewer's yeast induced pyrexia in rats with respect to control group. The anti pyretic activity of the extract was comparable to the standard prototype, paracetamol.

Keywords: *Zizyphus jujuba*, anti pyretic activity,Yeast induced pyrexia.

1. INTRODUCTION

Zizyphus jujuba Lam is also called as Badar, Baer, Bogari, Barihannu belonging to the family Rhamnaceae. The plant is distributed throughout India, Iran, Afghanistan and in China. It is a small sub deciduous tree with dense spreading crown, commonly 0.6m girth and 6m high. Leaves are 3-6.3 by 2.5-5 cm oblong or ovate, usually minutely serrulate or apex distinctly toothed, obtuse, base oblique and 3-nerved, nerves depressed on the glabrous shining upper surface, densely clothed beneath with white or buff tomentum.

A survey of literature on *Zizyphus jujuba* Lam. revealed a few pharmacological reports on the plant like antioxidant and antilisterial effect [1-3], antisteroidogenic activity [4], antiobesity activity [5], sedative and hypnotic [6], anxiolytic [7], anticancer [8].

The plant is reported to contain alkaloid jubanine-E [9]. It contains three flavones-C-glucosides-6"sinapoylspinosin, 6"-feruloylspinisin and 6-"p-coumaroylspinosin. The leaves and stems of ziziyphus jujuba lamk contains saponins 3-o-[2-α-L-fucopyrnosyl-3-o-β-D-glucopyranosyl-α-L- arabinopyranosyl] jujubogenin. The fruits of *Zizyphus jujuba* lamk contain zizyphus saponins I, II, III and jujuboside B [10], jujuboside D [11], and jujuboside [12]. The bark of *zizyphus jujuba* Lamk contains 7% tannin [13].

2. MATERIAL AND METHODS

2.1. Preparation of extract

The fresh leaves were collected and dried in the drying room, with active ventilation at ambient temperature (25±1°C) and packed in paper bags. The powdered plant material was extracted with successive solvent extraction ranging from non polar to polar, using soxhlet hot extraction process. The solvent was distilled under reduced pressure which gave brownish black color residues. The methanol extract was collected and used for the present study [14-20].

2.2. Animals

Albino rats (wistar strain) of either sex weighing 160-200 g were used in the study. The animals were kept in polypropylene cages and maintained by balanced food and water ad libitum. Experiments were verified and anti pyretic activity were performed complied with the rulings of the Committee for in animal models; the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) New Delhi, India and the study was permitted by the institutional ethical committee of JKKMMRF College of pharmacy, Komarapalayam, Tamilnadu, India.

2.3. Antipyretic Evaluation

The antipyretic activity of Zizyphus jujuba (leaves) was evaluated using Brewer's yeast induced pyrexia in rats. For this study the 20 ml/kg of 20 % aqueous suspension of Brewer's yeast in normal saline was administered after measuring the rectal temperature using the digital thermometer. Eighteen hours (0 h) after the yeast injection, the animals were again placed in individual cages for recording the rectal temperature. The *Zizyphus jujuba* extract 200 and 400 mg/kg, were administered orally 18 h after the yeast injection to the two groups of rat. The animals of control group were administered orally the suspension of 2% aqueous solution of Tween 80 in a volume of 5 ml/kg. The animals of fourth group received the standard prototype antipyretic agent, paracetamol (150

mg/kg) orally. The rats were restrained for their rectal temperature to be recorded at the 0 h immediately before *Zizyphus jujuba* or vehicle or paracetamol administration and again at hourly intervals for next five hours after injection.

2.4. Statistical Analysis

All the statistical analyses was performed using the software GraphPad InSta (Graph Pad Software Inc, USA. www.graphpad.com). The values were expressed as mean ± SEM. Significance was evaluated by one-way ANOVA followed by Dunnet's test. *P* values less than 0.05 simply significance.

3. RESULTS

The experimental rats showed a marked increase in rectal temperature 18 hours after Brewer's Yeast injection. In the first hour, the antipyretic effect of *Zizyphus jujuba* (200 and 400 mg/kg) was significant ($p<0.05$ and $p<0.01$, respectively). Table 1 suggests that *Zizyphus jujuba* at a dose of 200mg/kg caused a highly significant reduction at third hour ($p<0.001$). However, the effect increases significantly at the dose of 400 mg/kg having $p<0.01$ at first, second and fourth hour. The antipyretic effect was comparable with that of a standard paracetamol.

Table 1: Antipyretic Activity of MEZJ Leaves

Drug	Rectal temperature in °C at time(h)						
	18hr after yeast injection	0 hour	1 hour	2 hour	3 hour	4 hour	5 hour
Control (5ml/kg)	36.4±0.03	36.5±0.05	36.5±0.10	36.6±0.04	35.8±0.03	36.0±0.04	35.5±0.02
Zizyphus jujuba(200mg/kg)	35.8±0.04	36.2±0.08	36±0.10***	36.9±0.07*	35.2±0.02**	36±0.14	36.3±0.11*
Zizyphus jujuba(400mg/kg)	35.4±0.02	35.5±0.14	35.5±0.06*	35.4±0.02*	35.8±0.01***	35.4±0.11*	35.2±0.20***
Paracetamol (150mg/kg) oral	36.4±0.04*	36.2±0.02	36±0.08	36±0.02*	35.8±0.02**	35.5±0.1*	35.6±0.09

4. DISCUSSION

Methanolic extract of *Zizyphus jujuba* developed to have therapeutic effects in antipyretic activity, or in the disease associated with increase in temperature. One such disease is arthritis, which include cartilage destruction with increase in temperature surrounding the joints and sometimes whole body. Various parts of *Zizyphus jujuba* have been used for hundreds of years and their safety and efficacy are well established through a long history of human use. The scientific research of this plant is currently more focussed on the identification, isolation and characterization of active principle(s) from crude extracts. The fact that strong synergism of several constituents in the crude drug may prove more potent and effective than any single purified compound, is always overlooked. Moreover, this may help to nullify the toxic effects (if any) of individual constituents. Taking consideration of these facts, the antipyretic activity was performed. A large number of pharmacological activities have been reported from this plant. A critical review of this plant has been published earlier regarding the traditional use, ethnopharmacology and toxicological studies.

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