



Anti-ulcer effect of *Bauhinia variegata* Linn. in rats

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Abstract

Objective: To evaluate the ulcer protective effect of alcoholic extract of *Bauhinia variegata* in rats. **Materials and methods:** The anti-ulcer activity of alcoholic extract of *B. variegata* was evaluated against gastric ulcer induced by pyloric ligation and aspirin induced ulcer model in rats. The stomach was incised along with greater curvature and examined for ulcer. Effect of alcoholic extract of *B. variegata* on volume of gastric secretion, total, free acidity and ulcer index in pylorus ligated and aspirin induced ulcer rat was determined. **Results:** Oral administration of alcoholic extract of *B. variegata* decreased the volume of gastric secretion, total, free acidity and ulcer index with respect to control. **Conclusion:** The alcoholic extract of *B. variegata* possesses significant ($P < 0.001$) ulcer protective activity.

Keywords: Anti-ulcer, *Bauhinia variegata*, pyloric ligation, aspirin.

1. Introduction

Bauhinia variegata Linn (Caesalpiniaceae) grows as a medium sized, deciduous tree found throughout India [1]. It is active as antibacterial and antifungal [2]. The phytochemical studies reveals the presence of 5-7 dimethoxy and dihydroxy flavonone 4-O- α -L rhamnopyranosyl- β -D glucopyranosides, lupeol, β -sitosterol and quercetin [3, 4]. The study assumes significance in the context that prolonged use to synthetic anti-ulcer drugs leads

to adverse drug reaction hence search for new anti-ulcer agent that retain therapeutic efficacy and are devoid of adverse drug reaction. In this context study of the alcoholic extract of *B. variegata* against pylorus ligation and aspirin induced ulcers was undertaken in a rat model.

2. Materials and methods

The stem of *Bauhinia variegata* was collected in and around Salem District in the month of

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June and authenticated by Botanist, Botanical Survey of India, Coimbatore. A voucher specimen kept in our laboratory for reference.

The stems were dried in shade and powdered. The powder was extracted with alcohol (95% v/v) using Soxhlet's apparatus. The extract was evaporated under vacuum. The extractive value (% w/w) of the alcoholic dry extract was 4.5% w/w. The extract was suspended in 5% gum acacia and used for studying anti-ulcer activity.

Male albino rats weighing between 150 and 175g were selected for pyloric ligation ulcer model [5]. Rats were divided into 3 groups, each group consisting of six animals. Animals were fasted for 24 h.

One group received normal saline 2ml/ kg p.o (negative control), the second group received ranitidine (20mg/kg p.o) and the third group received alcoholic extract of *B. variegata* (250mg/ kg p.o) 30 min prior to pyloric ligation. The animals were sacrificed 4 h later and the stomach was opened to collect the gastric contents. The total volume of gastric content was measured. The free acidity, total acidity were estimated and ulcer index was calculated [6].

In the aspirin induced ulcer model [7], the rats were divided into 3 groups each consisting of 6 animals. The first group served as a control

group. The second and third groups were treated respectively with ranitidine (20mg/kg) and alcoholic extract of *B. variegata* (250mg/ kg) orally for 8 days. Control animals received normal saline (2 ml/kg) for 8 days. After 8 days of treatment, animals were fasted for 24 h. Ulcers were produced by administration of aqueous suspension of aspirin in a dose of 200mg/kg orally on the day of experiment. The animals were sacrificed 4 h later and the ulcer index was calculated [6].

3. Results and discussion

The effect of alcoholic extract of *B. variegata* on pylorus ligated rat and aspirin induced ulcer model is presented Table 1 and 2 respectively. The result of the present studies indicate that the alcoholic extract significantly reduced the total volume of gastric juice, free and total acidity of gastric secretion and activity against gastric ulcers in rats.

The control animals had ulcers and haemorrhagic streaks, whereas in animals administered with the alcoholic extract of *B. variegata* there was significant reduction in ulcer index ($P < 0.001$).

It is generally accepted that gastric ulcers result from an imbalance between aggressive factors and the maintenance of the mucosal integrity through the endogenous defence mechanism [8].

Table 1
Effect of alcoholic extract of *B. Variegata* on pylorus ligated rats

Design of treatment	Dose (mg/kg)	Volume of gastric secretion (ml/100g)	Free acidity (mEq/l)	Total acidity (mEq/l)	Ulcer Score
Control (Normal Saline)	2ml/kg	7.5 \pm 0.22	23.6 \pm 0.30	54.0 \pm 0.30	2.8 \pm 0.05
Ranitidine	20	3.8 \pm 0.01*	9.6 \pm 0.02*	20.6 \pm 0.19*	1.0 \pm 0.08*
Alcoholic extract of <i>B. variegata</i>	250	4.3 \pm 0.10*	9.8 \pm 0.25*	25.7 \pm 0.42*	1.4 \pm 0.02*

n=6 animals in each group, * $P < 0.001$ when compared to control.

Values are expressed as mean \pm SEM, Data were analysed by Student's *t* - test.

Table 2

Effect of alcoholic extract of *B. variegata* on aspirin induced gastric ulcer in rats

Design of treatment	Dose (mg/kg)	Ulcer score	Percentage protection from ulcer
Control (Normal Saline)	2ml/kg	3.1 ± 0.33	-
Ranitidine	20	1.0 ± 0.01*	67.74
Alcoholic extract of <i>B. variegata</i>	250	1.6 ± 0.02*	48.38

n=6 animals in each group, *P<0.001 when compared to control.

Values are expressed as mean ± SEM, Data were analysed by Student's *t* - test.

Several studies indicated that excess gastric acid formation by prostaglandin (PG) include both increase in mucosal resistance as well as decrease aggressive factors, mainly acid and pepsin [9]. Inhibitions of PG synthesis by aspirin coincide with the earlier stages of damage to the cell membrane of mucosal, parietal and endothelial cells [10].

Recent reports have indicated that many flavonoids possess antiulcerogenic activity [11,12]. So the anti-ulcer activity of alcoholic extract of *B. variegata* may due to its flavonoids content.

In this study we observed that alcoholic extract of *B. variegata* provides significant anti-ulcer activity.

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