

Research Article

Investigation of Anti-Ulcer Activity of Alcoholic Extract of Bark of *Albizia lebbbeck* on Pyloric Ligated Rodent Model

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ABSTRACT

The present study was carried out to evaluate the anti-ulcer activity of *Albizia lebbbeck* bark extract against pyloric ligation induced gastric ulcer. The alcoholic extract of 200 and 400 mg/kg oral administration markedly decrease the incidence of ulcers in pyloric ligated rats. All the test groups accelerated the healing process to different extents. The alcoholic bark extract of *Albizia lebbbeck* at dose of 200 and 400 mg/kg showed significant reduction in the above parameters which was comparable to the standard drug Pantoprazole. Gastric mucin protection and regeneration was found to be due to aqueous extract administration was found to having good antiulcer property.

Keywords: *Albizia lebbbeck*, Ulcer index, Pylorus ligation.

INTRODUCTION

In Ayurveda peptic ulcer mostly refers to *Amlapitta* or *Parinamasula*. *Amlapitta* is a disease of the gastrointestinal tract, especially of the stomach. *Amlapitta* literally means, leading to sour taste. Number of drugs including proton pump inhibitors, prostaglandin analogs, histamine receptor antagonists and cytoprotective agents are available for the treatment of peptic ulcer. But most of these drugs produce several adverse reactions including toxicities and even may alter biochemical mechanisms of the body upon chronic usage. Hence, herbal¹ medicines are generally used in such cases when drugs are to be used for chronic periods. Several natural drugs have been reported to possess anti-ulcerogenic activity by virtue of their predominant effect on mucosal defensive factors.

At the same time, anti secretory-anti ulcer drugs² confers simpler to several side effects like arrhythmias, impotence, gynaecomastia, hyperplasia and haemopoietic changes. This has been the major stimulus for the development of new antiulcer drugs and anti-inflammatory for novel molecules has been extended to herbal drugs that offer better protection and decreased relapse. Medicinal

plants^{3,4} provide an important source of new chemical substances with potential therapeutic effects. These have been used in traditional medicine for the treatment of several diseases^{5,6}.

Herbal medicines have the ability to affect body systems. The effects are dependent on the chemical constituents present in the plant used. *Albizia lebbbeck* (Mimosaceae), is widely grown in tropical and subtropical region of Asia and Africa. It is fast growing and medium sized deciduous tree. The bark extract possess antiprotozoal, hypoglycemic, antidiabetic, antioxidant and anticancer properties. Based on these previous findings, we investigated the comparative evaluation the antiulcer activity of bark of *Albizia lebbbeck*^{6,7}.

MATERIALS AND METHODS

Plant Material

Albizia lebbbeck (L.) bark were sampled in a collection from the local area. The bark of these plants were dried under shade at room temperature (27- 30°C), for 15-30 days, after which the bark of the plant were chopped and grounded into coarse powder. The powdered material was transferred to soxhlet extraction⁸ apparatus and marc was extracted with ethanol.

Experimental Animals

Healthy albino Wister rats of 250 gm were used throughout study. They were Maintained in a controlled environmental condition of temperature and humidity on alternatively. All animals were fed with standard pellet diet⁹ and water *ad libitum*. Animal experimental studies were conducted according to the guidelines of institutional animal ethical committee. All the animals were randomly selected and divided into four groups containing 5 animals in each group. Animal were divided in to four groups, each contain 5 animals. Group- I acts as control and received only saline by oral route. Groups- II received Pantoprazole (20 mg/kg) as reference drug. Group-III and IV received extract of *Albizia lebbbeck* in a dose of 200 and 400mg/kg.

Acute Toxicity

Acute toxicity was performed on albino rats by oral administration at a dose level up to 2000mg/kg of the bark extract of *Albizia lebbbeck* as per the OECD guidelines No. 423.

Pylorus- ligation induced gastric ulcer

Animals were anesthetized with ether and stomach exposed with small incision. Thread passed around the pyloric sphincter and applied a tight knot. After 4 hr of pyloric ligation, animals were sacrificed by decapitation method. Stomach was removed to collect the gastric contents. The mucosal surface was macroscopically observed and ulcer scores were determined^{10,11}.

Score the ulcers as below:

0= normal colored stomach

0.5= red coloration

1= spot ulcers

1.5= heamatologic streaks

2= ulcers \geq 3 but \leq 5

3=ulcers \geq 5

The total volume of gastric content was measured. The gastric contents were centrifuged at 1000 rpm for 10 min. One ml of the supernatant liquid was pipetted out and diluted to 10 ml with distilled water. The

solution was titrated against 0.01N NaOH using Topfer's reagent as indicator, to the endpoint when the solution turned to orange colour. The volume of NaOH needed was taken as corresponding to the free acidity. Titration was further continued till the solution regained pink colour. The volume of NaOH required was noted and was taken as corresponding to the total acidity^{12,13}.

Acidity was expressed as:

$$\text{Acidity} = \frac{\text{Volume of NaOH} \times \text{Normality} \times 100}{0.1}$$

Statistical analysis

The values Mean \pm SEM are calculated for each parameter. For determining the significant inter group difference each parameter was analysed separately and one-way analysis of variance was carried out.

RESULTS AND DISCUSSION

The pylorus ligation produces the ulcers in albino rats. The effect of the alcoholic extract of the albizia lebbbeck bark doses 200 mg/kg, 400 mg/kg showed significant effect, when compared with the control may be the presence of saponin contents in the bark extract¹⁴.

The percentage of protection is more in test-2 group when compared with the control group. Albizia lebbbeck bark having more saponins contents, they showed more effect in the animals. When compared with the standard group the test-2 showed near effect, so the bark having anti-ulcer effect. The ulcer index was measured, and the standard group showed the more significant value ($p < 0.01$) when compared to control group. The test 1 & test 2 group (low dose & high dose respectively) showed the significant values when compared to control group [Figure-1]. Test-1 and test-2 groups showed significant changes in ulcer index when compared with control group may be due to the presence of ulcer protective agents present in the plant alcoholic extract.

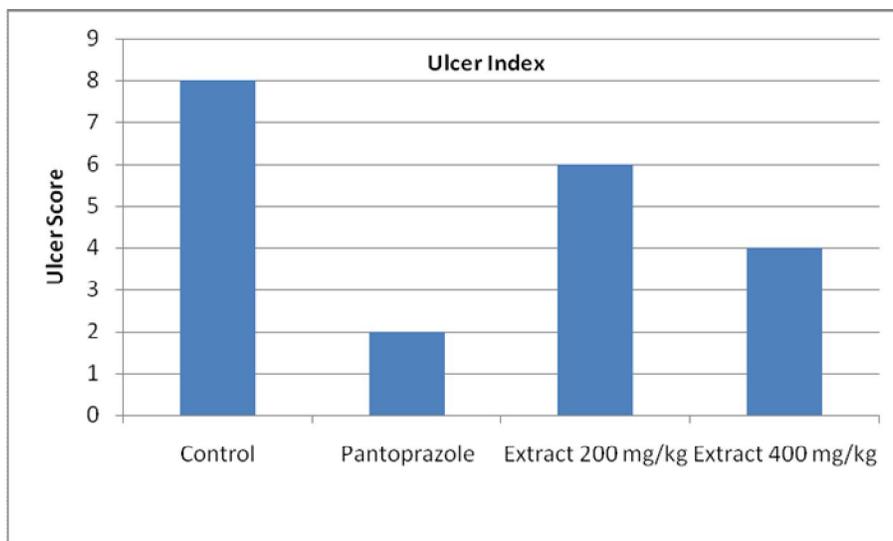


Fig. 1: Ulcer Score index of bark of *Albizia lebbek*

The pH & Volume of gastric juice was measured, and the standard group showed the more significant value when compared to control group. The test 1 & test 2 group (low dose & high dose respectively) showed the significant values when compared to control group.

CONCLUSION

Alcoholic extract of *Albizia lebbek* bark high dose show the effect as nearer to the standard drug. The anti ulcer activity due to the presence of Tannins, flavonoids, alkaloids, saponin contents which are present in the alcoholic extract of *Albizia lebbek* bark act as gastroprotective agents in animals, by suppress the gastric acid secretions, reduce the ulcer formations in stomach.

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