

THERAPEUTIC ACTIVITY OF DIFFERENT EXTRACTS OF *BAUHINIA RACEMOSA*
LAM BARK ON CYSTEAMINE INDUCED ULCERSDr. C. Girish^{1*}, A. Neelima² and D. Haritha Goud³^{1,2,3}S.V.U. College of Pharmaceutical Sciences, Sri Venkateshwara University, Tirupati - 517502. A.P, India.

Received on: 22/01/2020

Revised on: 12/02/2020

Accepted on: 02/03/2020

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ABSTRACT

An experiment was conducted to study the antiulcer effect of the dried bark powder of the plant *Bauhinia racemosa* in wistar albino rats. Cysteamine induced duodenal ulcer in the rat is widely used as a model of peptic ulcer disease. 36 wistar rats of either sex weighing between 180 -200gm were selected and divided into six groups, each comprising of 6 rats. 6 groups of rats were given with 0.5% CMC solution, 50 mg/kg of Ranitidine, 200 mg/kg of aqueous extract of *Bauhinia racemosa*, 400mg/kg of aqueous extract of *Bauhinia racemosa* (AEBR), 200 mg/kg of methanolic extract of *Bauhinia racemosa* and 400mg/kg of methanolic extract of *Bauhinia racemosa* (MEBR) respectively. After one hour all the groups were administered with cysteamine at a dose of 400 mg/kg body weight orally. After 24 hrs, note down the number of ulcers, ulcer score, percent incidence, ulcer index and healing index were recorded. From the results obtained it was concluded that the methanolic extract at a dose of 400mg/kg shows antiulcer activity.

KEYWORDS: *Bauhinia racemosa*, cysteamine, antiulcer activity.

INTRODUCTION

Ayurveda, the ancient Indian therapeutic measure is one of the major systems of alternative and complementary medicine.^[1] As the other herbal systems, greater parts of its medicaments are based on indigenous herbal drugs and the thorough and fractionate knowledge about the medicinal plant is mandatory for all who is working in the field of ayurveda, in order to identify and select the appropriate plant for the ailment of specific disease.^[2] Less pollution we make and more ecological balance we can maintain, and will add the happiness to the mankind. Preserve the knowledge about the medicinal plants, herbs, spices and herbal remedies, which mankind has received from the previous generations, for posterity.^[3] In the western world documentation of use of natural substances for medicinal purposes can be found as far back as 78 A.D., when Dioscorides wrote "De Materia Medica", describing thousands of the medicinal plants.^[4,5] Medicinal plants have always been considered as a healthy source of life for all people in the world. Therapeutic properties of medical plants are very useful in treating various diseases and the advantage of these medicinal plants is being 100% natural.^[6,7] Nowadays people are being bombarded with thousand of unhealthy and contaminated products, the level of sensibility in front of diseases is more and that is why the use of medicinal plants can represent the best solution.^[8]

Traditional system of medicine in India includes Ayurveda, Siddha and Unani which are based on the use of variety of herbal medicine.^[9] Flavonoids from

Bauhinia racemosa has antiulcer properties and used for the prevention and treatment of peptic ulcer.^[10] The phytochemical compounds with anti-ulcer activity include flavonoids (i.e. quercetin, naringin, silymarin, anthocyanosides and sophoradin derivatives), saponins and tannins.^[11] The plant *Bauhinia racemosa* also showed antiulcer and anti-inflammatory properties.^[12] Pharmacologist and toxicologist are exploiting plants for ethno-veterinary and for human uses and are converting the extracted parts of the plants into drug for the livestock. Therefore, there is need to undertake relative pharmacological evaluation on different parts of the plant.

MATERIALS AND METHODS

Collection of Plant material

The plant material i.e. bark of *Bauhinia racemosa* was collected from in and around tirupati. The plant material was coarsely powdered with the help of rotary grinder and the powder is stored in airtight plastic containers. The prepared powder was used for the preparation of extracts.

Preparation of extract

Bark of *Bauhinia racemosa* was dried and it was subjected for size reduction to a coarse powder and powder is used for extraction. For preparation of AEBR, the powder was taken into a conical flask with distilled water (1400 ml) [in a ratio of 1:20] and boiled at a temperature of 40° c for 3 hours on a heating mantle. After 3 hours, the flask was cooled and then filtration

was carried out. The filtrate collected was then subjected to evaporation on a heating mantle at a temperature of 100° c. The residue collected was dark brown in colour.

For the preparation of MEBR, 100 gm of powder was extracted with the help of Soxhlet apparatus by using 400 ml petroleum ether for about 48 h. After defatting, the marc was dried in hot air oven at 50°C and it is packed in Soxhlet apparatus for further extraction with 400 ml of methanol until the absence of residue on evaporation.

The product obtained was kept for lyophilisation by a freeze-dryer to produce powdered forms of the extracts. Lyophilisation removes the solvents from the solutes and stabilizes the formulation so that it can retain satisfactory pharmacological activity during long-term storage. The freeze-dried products were stored in sterile dark brown colour bottles and refrigerated (4° c) until time of use.

Experimental animals

36 adult wistar rats of either sex that weighed between 180-200 gm was housed separately. This animals were left for 48 hrs to acclimatize to the animal room condition. They were maintain in standard laboratory conditions of temperature 22+-2°c, humidity 12 hours light and dark cycles fed with standard pellet diet (Hindustan lever, banglore) and adequate tap water

Cysteamine induced ulcer model.^[13]

Duodenal ulcers were induced by administration of cysteamine hydrochloride at adose of 400 mg/kg p.o, in aqueous solution at an interval of 4 h for two times. All the animals are divided into 6 groups of 6 animals in each group. The treatment protocol for each group is as follows:

Group 1: 0.5% CMC solution (Control)

Group 2: 50 mg/kg of Ranitidine (Standard)

Group 3: 200 mg/kg of aqueous extract of *Bauhinia racemosa* (AEBR)

Group 4: 400mg/kg of aqueous extract of *Bauhinia racemosa* (AEBR)

Group 5: 200 mg/kg of methanolic extract of *Bauhinia racemosa* (MEBR)

Group 6: 400mg/kg of methanolic extract of *Bauhinia racemosa* (MEBR)

Table 1: Effect of AEBR and MEBR on cysteamine induced duodenal ulcers.

Treatment groups	Dose	Ulcer area (mm ²)	Ulcer score	Ulcer index
Control	---	5.50± 0.258	3.0±0.365	7.5±0.458
Ranitidine	50 mg/kg	2.8±0.24**	1.4±0.23**	4.8±0.35**
AEBR	200 mg/kg	4.2±0.21	2.7±0.24	6.5±0.21
AEBR	400 mg/kg	3.8±0.215*	2.4±0.18*	5.9±0.23*
MEBR	200 mg/kg	4.23±0.43*	2.1±0.23*	6.2±24*
MEBR	400 mg/kg	2.9±0.43**	1.7±0.21**	5.0±0.31**

Values are mean ± SEM, n =6. **p*<0.05 and ***p*<0.01, when compared to control

DISCUSSION

Different therapeutic agents are used to inhibit the acid secretion or to boost the mucosal defence mechanisms by

After the respective treatment all the animals were sacrificed 48 h after the administration of Cysteamine by over dose of ether anesthesia and the duodenum were excised carefully and make a longitudinal cut, open and expose the mesenteric area.

Evaluation parameters

Ulcer scoring^[14]

After sacrificing the rat, duedenum was removed and make a longitudinal cut, open and washed it slowly under running tap water. Put it on the galss slide and observe under 10x magnification and score the ulcer as above. Note down the number of ulcers per animal and severity scored by observing the ulcers microscopically with the help of 10x lens and the ulcers were given scores based on their intensity as follows.

0 = no ulcer,

1 = superficial mucosal erosion,

2 = deep ulcer

3 = perforated or penetrated ulcer.

Ulcer index^[15]

The ulcer index was calculated by using the following equation

U.I. = Arithmetic mean of + number of ulcer positive animals ×2 intensity in a group Total number of animals

Statistical analysis of data

Results were expressed as mean ± S.E.M. the statistical difference between the groups in the term of the mean rate of wound healing was calculated in terms of ANOVA mean ± S.E.M. the difference was considered significant if *p*<0.01

RESULTS

In the control group Cysteamine induced characteristic lesions in the glandular portion of rat duodenum which appeared as elongated bands of thick, black & dark red lesions. But Administration of MEBR at a dose of 400 mg/kg shown significant protection against ulcers with that of the standard group receiving Ranitidine as standard drug and is represented in Table 1. So by observing the results, MEBR is having the antiulcer activity.

increasing mucosal production, stabilising the surface epithelial cells or interfering with the prostaglandin synthesis.^[16,17] Cysteamine inhibits the alkaline mucus

secretion from the Brunner's glands in the proximal duodenum and stimulates gastric acid secretion rate. Gastric emptying is also delayed and serum gastrin concentration is increased. This chemically induced ulcer resembles duodenal ulcers in man to its location. The massive intracellular accumulation of calcium represents a major step in the pathogenesis of gastric mucosal injury. This leads to cell death and exfoliation in the surface epithelium.^[18]

The antiulcer activity of aqueous and methanolic extracts of the stem bark of *Bauhinia racemosa* was observed. From the results obtained, it was observed that, there was decrease in percent of incidence of ulcer and ulcer index in a dose dependent manner when compared with control group. So it was considered that the plant *Bauhinia racemosa* has significantly decreased the no of ulcers in cysteamine induced gastric ulcers in rats. This may due to the presence of flavonoids which may reduce the gastric secretion and peptic activity and prevent the formation of gastric ulcer.

CONCLUSION

The present study involves the investigation of anti-ulcer property of aqueous and methanolic extracts of *Bauhinia racemosa*. From the study the following conclusions are made. Pre-treatment with *Bauhinia racemosa* protect the mucosa against the ulcerogenic actions of cysteamine. Thus the result from our study suggested that the plant *Bauhinia racemosa* has potent anti-ulcer property.

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