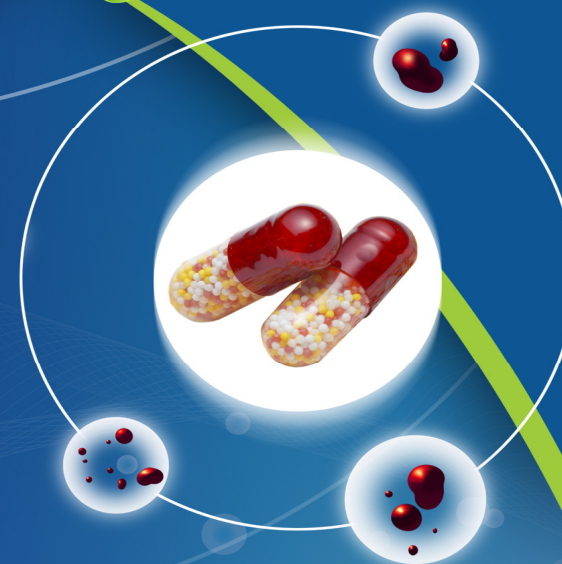




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**Research Article**

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**Evaluation Of Anti -Ulcer Activity of Alcoholic Extract of *Hibiscus Rosa Sinesis* In Rats.****Deshmukh M. T<sup>1</sup>., Shete R. V<sup>1</sup>., Deshmukh V. T<sup>2</sup>. Borate S. R<sup>1</sup>. Nagul B<sup>1</sup>.**

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<sup>2</sup> Medha College of Pharmacy, Medha, Satara, Maharashtra, India.**Received: 18 Desember 2012****Revised and Accepted: 09 January 2013****ABSTRACT**

Gastric ulcers the most wide state disease and are a very common global problem today. Peptic ulcer is a lesion of the gastric/duodenal mucosa occurs at a site where the mucosal epithelium is exposed to acid and pepsin. As plants are a rich source of active principles and antioxidants, there has been a growing interest to identify and scientifically validate agents that have traditionally been used in folk medicine in the treatment of gastric ulcers and related diseases. *Hibiscus Rosa-Sinensis* a well known member of the family Malvaceae, *Hibiscus rosa-sinensis* grows as an evergreen herbaceous plant. *H. rosa sinensis* has been used for the treatment of a variety of diseases. Traditional uses of this plant are refrigerant, emollient and emmenagogue, aphrodisiac; decoction given in bronchial catarrh; infusion of petals is a refrigerant drink in fever, demulcent in cough and useful in strangury, cystitis and other genito-urinary troubles. In this experiment positive control group ligation of pylorus showed increase in gastric juice, ulcer index, pH of gastric juice and free acidity. Administration of Ranitidine (30mg/kg), HAHR (100 & 200 mg/kg) showed significant reduction with respect to above parameters and showed significant increase in % gastroprotection. In present study HAHR significantly reduced the gastric acid secretion. The cyto-protective action which promotes the generation of prostaglandin and causes decreases in secretion of gastric acid, mixture significantly reduced the gastric ulceration in pyloric ligated rats without affecting the gastric secretion or pepsin. Phytochemical examination revealed that HAHR contains saponins, sterols and flavonoids. Saponins, sterols and flavonoids present in HAHR may be responsible for antiulcer activity in pylorus induced ulcer model.

**Keywords:** *H. rosa sinensis*, Pylorus ligation, Antiulcer activity**INTRODUCTION**

Gastric ulcers the most wide state disease and are a very common global problem today. Peptic ulcer is a lesion of the gastric/duodenal mucosa occurs at a site where the mucosal epithelium is exposed to acid and pepsin.

The aggressive and protective factors in the stomach are acid pepsin secretion, mucosal barrier, blood flow, cellular regeneration, prostaglandins and epidermal growth factors. Factors such as stress, smoking, nutritional deficiency and ingestion of NSAID'S all can increase the incidence of gastric ulcers. It is reported that prolonged anxiety, emotional stress, haemorrhagic surgical shock, burns and trauma are known to cause severe gastric irritation [1]. Agents that are currently available for the treatment of gastric ulcers act by either reducing gastric acid secretion ( $H_2$  blockers, proton pump inhibitors, anti-muscarinic agents),

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acting as physical barriers (sucralfate, colloidal bismuth subcitrate), or increasing the mucous and bicarbonate secretion (prostaglandin analogues, carbenoxolone) [2-3]. The currently used antiulcer drugs like  $H_2$  receptors blockers, proton pump inhibitors, antimuscuranics produce adverse reactions such as hypersensitivity, arrhythmia, impotence and haemopoietic changes with is a possibility of increased rate of ulcer recurrence within one year after cessation of the treatment. Because of the above mentioned demerits reported with the current antiulcer therapy there is a need for the search of newer therapeutic antiulcer agents from plant sources from the alternative therapy Ayurvedha [4-6]. As plants are a rich source of active principles and antioxidants, there has been a growing interest to identify and scientifically validate agents that have traditionally been used in folk medicine in the treatment of gastric ulcers and related diseases [7].

*Hibiscus Rosa-Sinensis* a well-known member of the family Malvaceae, *Hibiscus rosa-sinensis* grows as an evergreen herbaceous plant. It is an easily available plant for natural remedies. *H. rosa sinensis* has been used for the treatment of a variety of diseases. Traditional uses of this plant are refrigerant" emollient and emmenagogue, aphrodisiac; decoction given in bronchial catarrh; infusion of petals is a refrigerant drink in fever, demulcent in cough and useful in strangury, cystitis and other genito-urinary troubles. Oil from the fresh petals and olive oil in equal proportion find application in alopecia, anodyne, emollient and aperient; juice beneficial in gonorrhoea, alopecia and also used for blackening hair. Several articles and ancient literature have shown that the flowers of this plant possess antifertility activity, like antimplantation, abortifacient, in rodents. The aqueous-ethanolic extract of aerial parts of *H. rosa sinensis* was reported for its use in constipation and diarrhea [8]. Antiulcer activity of *Hibiscus Rosa-Sinensis* yet has not been scientifically reported, hence the present study was planned to evaluate antiulcer activity of alcoholic extract of *Hibiscus Rosa-Sinensis* in pylorus ligation induced gastric ulcer model in experimental animals [9].

## METHODS AND MATERIALS

### *Anti-ulcer Activity:*

#### *Pylorus ligation induced ulcer model*

Albino rats weighing between (160-200 gm) were divided into 8 groups of 6 rats in each. They were fasted in individual cages with measures taken to avoid coprophagy for 24 h prior to the experiment with free access to water. Group A was served as normal control given with vehicle only. Group B with standard drug, groups C, D, E were treated with low, medium and high doses of HAHR [7, 9]. The various groups were treated with vehicle/drug/ extracts 30 min prior to pylorus ligation and the details of the protocol was given below:

Group A: Normal animals treated with vehicle only

Group B: Standard Ranitidine (30 mg/kg i.p)

Group C: Low dose of HAHR (100 mg/kg)

Group D: Medium dose of HAHR (200 mg/kg)

### *Experimental Procedure:*

Under light ether anesthesia, the abdomen was opened and the pylorus ligation performed and then sutured. 4 h after pylorus ligation all the animals were sacrificed with excess of anaesthetic ether and the stomach of each rat was dissected out. Gastric juice collected into centrifuge tubes was centrifuged at 1000 rpm for 10 min and volume was noted. The pH of the gastric juice was recorded by pH meter. The gastric content was subjected for analysis of free and total acidity. The stomachs were washed under running tap water and then focused under microscope to note the ulcers in the glandular portion. The numbers of ulcers per stomach were scored microscopically with the help of (10x) hand lens and the scoring is done as per standard procedure. Mean ulcer score for each animal is expressed as Ulcer Index. The percentage ulcer protection was calculated using the formula [10]. Percentage ulcer protection =  $U_t / U_c \times 100$  Where  $U_t$  = Ulcer index of treated group and  $U_c$  = Ulcer index of the control group.

### *Methods for biochemical estimation of free and total acidity:*



**Collection of gastric juice:**

Gastric content collected from pylorus ligated rats was centrifuged and the volume of gastric juice as well as pH of gastric juice was noted. The gastric juice was subjected to biochemical estimations as follows:

**Determination of free and total acidity:**

1 ml of gastric juice was pipetted into a 100 ml conical flask, 2 or 3 drops of Topfer's reagent was added and titrated with 0.01N Sodium hydroxide until all traces of red colour disappears and the colour of the solution turns to yellowish orange. The volume of alkali added was noted. This volume corresponds to free acidity. [7] Then 2 or 3 drops of phenolphthalein solution was added and titration was continued until a definite red tinge appears. Again the total volume of alkali added was noted now this

volume corresponds to total acidity. Acidity was calculated by using the formula,

$$\text{Acidity} = \frac{\text{Volume of NaOH} \times \text{Normality of NaOH} \times 100}{0.1} \text{ meq /lt/ 100g}$$

**RESULTS**

In positive control group ligation of pylorus showed increase in gastric juice, ulcer index, pH of gastric juice and free acidity. Administration of Ranitidine (30mg/kg), HAHR (100& 200 mg/kg) showed significant reduction with respect to above parameters and showed significant increase in % gastroprotection.

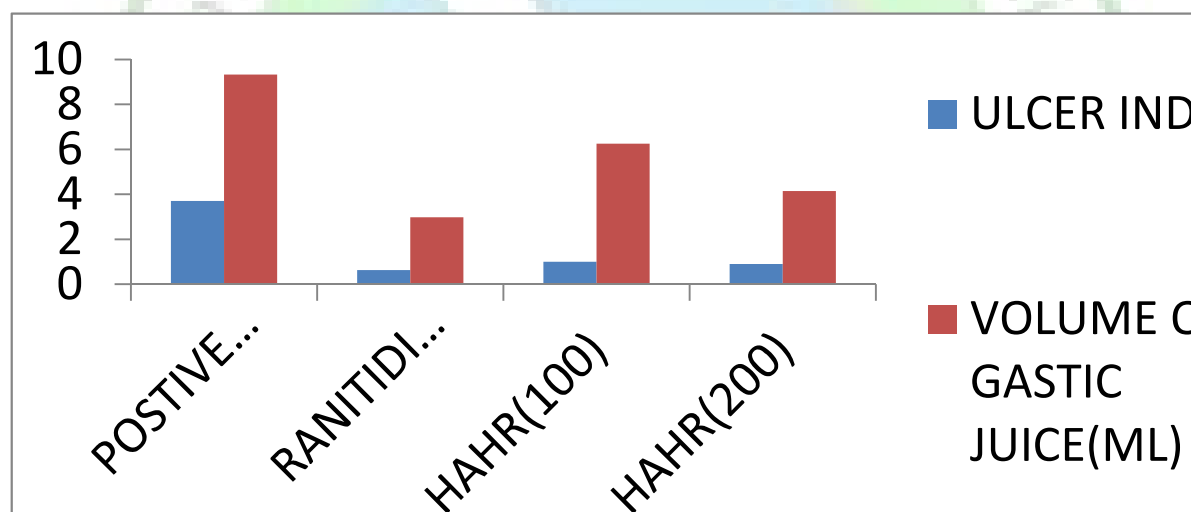


Fig. 1: Effect of HAHR on Ulcer Index and Volume of Gastric Juice:

**DISCUSSION**

Peptic ulcer is an excoriated area of the gastric or duodenal mucosa caused by action of the gastric juice. It is a chronic and recurrent disease, and is the most predominant of the gastrointestinal diseases. It is generally recognized that peptic ulcer is caused by a lack of equilibrium between the gastric aggressive factors and the mucosal defensive factors [10-11]. The currently used antiulcer drugs like  $H_2$  receptors blockers, proton pump inhibitors, antimuscuranics produce adverse reactions such as hypersensitivity,

arrhythmia, impotence and haemopoietic changes with is a possibility of increased rate of ulcer recurrence within one year after cessation of the treatment. Plant extracts some of the most attractive sources of new drugs show to produce promising and favourable reasons in the treatment of gastric ulcer [7, 12]. *H. rosa sinensis* has been used for the treatment of a variety of diseases. Traditional uses of this plant are refrigerant" emollient and emmenagogue, aphrodisiac; decoction given in bronchial catarrh; infusion of

petals is a refrigerant drink in fever, demulcent in cough and useful in strangury, cystitis and other genito-urinary troubles.

The aqueous-ethanolic extract of aerial parts of *H. rosa sinensis* was reported for its use in constipation and diarrhea [8]. Antiulcer activity

of *Hibiscus Rosa-Sinensis* yet has not been scientifically reported, hence the present study was planned to evaluate antiulcer activity of alcoholic extract of *Hibiscus Rosa-Sinensis* in pylorus ligation induced gastric ulcer model in experimental animals.

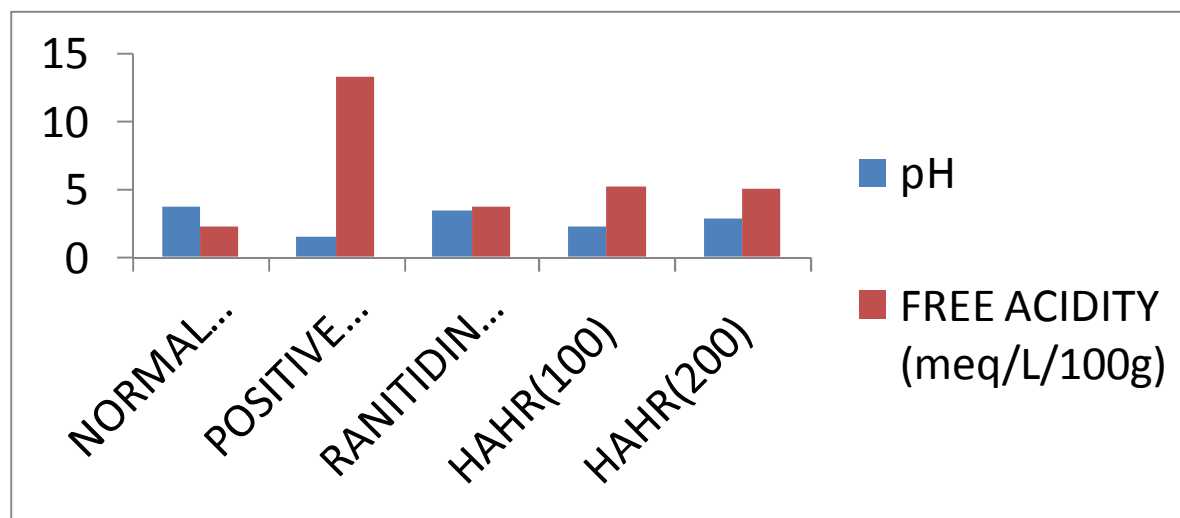


Fig. 2: Effect of HAHR on pH and Free Acidity:

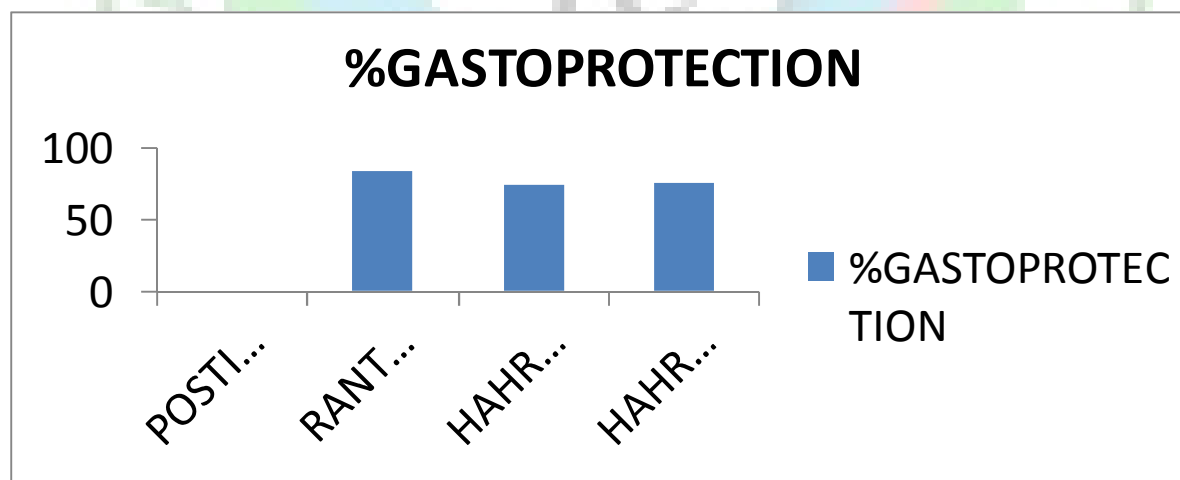


Fig. 3: % Gastroprotection in pylorus ligation model:

In pylorus ligation induced ulcer model gastric ulcers are due to over production of gastric acid or decrease in gastric mucous production. In this model acid-pepsin accumulation is increased due to pylorus obstruction and subsequent digestion of the mucous. The gastric ulcers caused after pylorus ligation are due to an increase in gastric HCl secretion, stasis of acid due to stress and over production of gastric acid increased volume

is also an important factor involved in ulcer formation as the unprotected lumen of the stomach is exposed to the accumulated acid [13, 14]. Cyto-protective action by drugs has been considered to be due to the generation of prostaglandins or blockade of back diffusion of  $H^+$  ions will be the major mechanism which is responsible for anti-ulcer activity. The cyto-protective action which promotes the generation

of prostaglandin and causes decreases in secretion of gastric acid, mixture significantly reduced the gastric ulceration in pyloric ligated rats without affecting the gastric secretion or pepsin [10, 15]. In present study HAHR significantly reduced the gastric acid secretion. Phytochemical examination revealed that HAHR contains saponins, sterols and flavonoids. Saponins, sterols and flavonoids present in

HAHR may be responsible for antiulcer activity in pylorus induced ulcer model [16, 17]. The major mechanism of action responsible for antinuclear activity of HAHR may be cytoprotective action or its antioxidant property. Further study required to isolate and characterised the main chemical constituent responsible for antiulcer activity and to explore exact mechanism of action.

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