

## EVALUATION OF *LANTANA INDICA* FOR ANTI ULCER ACTIVITY IN EXPERIMENTAL RATS

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### ABSTRACT

The leaves of *Lantana indica* used in the treatment of variety ailments such as ulcer, eczema, antiseptic and in rheumatism. In this study the antiulcer activity of various extracts of *Lantana indica* leaves were evaluated in pyloric ligation induced gastric ulcer in albino rats. The antiulcer activity was assessed by determining and comparing the ulcer index in the test drug group with that of the vehicle control and standard Ranitidine. The parameters taken to assess antiulcer activity were volume of gastric juice, free acidity, total acidity and ulcer index. The result indicated that Ranitidine, ethanol and aqueous extract significantly ( $p < 0.01$ ) decreased the volume of gastric acid secretion, free acidity, total acidity and ulcer index.

### KEY WORDS

*Lantana indica*, Ranitidine, Anti-ulcer activity, pyloric ligation.

### INTRODUCTION

*Lantana indica* Linn, a member of Verbenaceae is commonly known as "Indian Lantana" is a shrub native to India. Traditionally, the plant was reported to be used in the treatment of a variety of ailments all over the India. It was reported that the leaves of *Lantana indica* are used in traditional medicine for the treatment of the various human ailments such as eczema, antiseptic, antifungal and in rheumatism<sup>1, 2</sup>. The volatile oil obtained from the leaves of *L. indica* was containing trans-caryophyllene,  $\alpha$ -selinene, globulol, trans-caryophyllene oxide,  $\alpha$ -guaianevalencene, humulene and  $\beta$ -eudesmene<sup>3-5</sup>. The sterol fraction of the leaves of *L. indica* contained  $\beta$ -sitosterol and cholesterol<sup>6</sup>. From the roots, oleanolic acid, ursolic acid, 3b-24-dihydroxyolean-12-en-28-oic acid and

24-formyl-3-oxoolean-12-en-28-oic acid were isolated. 24-Hydroxy-3-oxooleanolic acid and methyl-24-hydroxy-3-oxooleanolate have also been identified in *L. indica*<sup>7, 8</sup>. Since the plant was reported to have many medicinal uses, the author has studied antiulcer activity leaf extracts.

### Plant material:

Fresh leaves (1 kg) of *Lantana indica* was collected from young matured plants from the Etunagaram region, Warangal district during early summer and authenticated by Prof. V. S. Raju, Taxonomist, Kakatiya University, Warangal. A voucher specimen (MRM/11/2012) was deposited in the A. U. College of Pharmaceutical Sciences, Andhra University and Visakhapatnam. The material was dried and powdered.

### Preparation of the extract:

The powdered plant material (500 g) of *Lantana indica* was extracted separately with 1 Liters of distilled water and 1 Liter of ethanol by maceration process for 72 h. The solvents were then removed under reduced pressure and dried in a desiccator (aqueous extract yield 11.18%w/w and ethanol extract yield 4.92%w/w with respect to dry material). The extracts were suspended in tween20 (20%v/v in distilled water) and used for the present study.

### Anti-ulcer activity of Aqueous and the ethanolic leaf extracts of *L.indica*

The antiulcer activity of the ethanolic extract of *L.indica* was evaluated on selected albino rats by pyloric ligated ulceration model.

### Pyloric ligated ulceration

This test was performed as suggested by Shay et al.. The selected animals were divided into four groups of six in each. Each group of the animals received one of the following test samples through oral route: 20%v/v tween 20 in distilled water (2 ml/kg), ranitidine (20 mg/kg), aqueous extract (200 mg/kg), ethanolic extract (200.mg/kg) After one hour, pylorus ligation was made under ether anesthesia. The animals were then returned to the observation chamber. After 4 h, the animals were sacrificed by decapitation, the abdomen of each animal was opened and the stomach was isolated after suturing the lower esophageal end. The gastric juice was collected by giving a small cut to the pyloric region just above the knot in a measuring cylinder and stomach was opened along the greater curvature. The mucosal layer

was washed with 1 ml distilled water and the washings were added to the gastric secretions. The gastric contents were centrifuged at 2000 rpm for 10 min. The supernatant fluid (1 ml) was diluted with 9 ml of distilled water and then titrated against 0.01N sodium hydroxide solution using Topfer's reagent till the solution turns to orange colour. The volume of sodium hydroxide required corresponds to free acidity. The solution was further titrated till the solution regained pink colour. The volume of sodium hydroxide required corresponded to the total acidity.

### RESULTS AND DISCUSSION

The findings of the study revealed that the leaf extracts possess significant anti-ulcer activity. All the test samples were found to reduce the volume of gastric acid to a significant extent ( $p < 0.01$ ), The total acidity and the free acidity also registered significant decrease in a similar manner. The ulcer index was significantly reduced with all test samples. The order of reduction of ulcer score observed was ranitidine < ethanol extract < aqueous extract, therefore expressed that the leaves of *L.indica* exerts anti-ulcer activity which may be due to anticipated inhibition of  $H_2$  receptors resulting in inhibition of gastric acid secretion elicited by histamine and gastrin. The work justifies its use in the traditional system of medicine.

The results were expressed as mean  $\pm$  S.E.M and tabulated in Table-2.3.1. Significance of differences between control and treated groups was determined using Student's t-test.

**Table-2.3.1: Anti-ulcer activity of the aqueous extract and ethanolic extract of the leaves of *L.indica* on pyloric ligated rats.**

Groups	Treatment	Dose	Volume of gastric juice(ml.)	Total acidity (meq/lit)	Free acidity (meq/lit)	Ulcer index
I	Vehicle (20% v/v Tween 20)	2 ml/kg	4.21 ± 0.16	16.43 ± 0.33	3.05 ± 0.09	3.82 ± 0.21
II	Ranitidine	20 mg/kg	2.03 ± 0.18**	6.52 ± 0.22**	0.52 ± 0.03**	0.68 ± 0.11**
III	Aqueous extract of <i>L.indica</i>	200 mg/kg	3.56 ± 0.17*	12.26 ± 0.29**	1.3 ± 0.14**	1.85 ± 0.26**
IV	Ethanolic extract of <i>L.indica</i>	200 mg/kg	3.38 ± 0.23*	10.08 ± 0.49**	0.99 ± 0.04**	1.37 ± 0.28**

Results expressed as Mean ± SEM from six observations \* P < 0.01, \*\* P < 0.001

### CONCLUSION

Based on the findings, it can be concluded that *Lantana indica* possesses significant Anti ulcer activity at all tested dose levels. These activities are dose-related. The results corroborate the basis for the traditional use of the plant in folk medicine.

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