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# EVALUATION OF ANTIULCER EFFECTS OF SEEDS EXTRACT OF *ANNONA RETICULATA*

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## ABSTRACT

The effect of ethanolic extract of seeds of *Annona reticulata,* was investigated in rats to evaluate antiulcer activity by using pyloric ligation ulcer model and the phytochemical studies were also carried out. The parameters taken for antiulcer activity were the total gastric volume secretion, total acidity, pH and ulcer index. Ethanolic extract of seeds of *Annona reticulata* significantly ($p < 0.001$) decreased gastric volume secretion (2.1 mL), total acidity (92 meq/L/100 g), and ulcer index (33.4).

**Key words:** Anti-ulcer, *Annona reticulata,* Pyloric ligation induced ulcer,

## INTRODUCTION

*Annona reticulata* belonging to the family of *annonaceae* is native of west Indies naturalized in eastern and south India, a small tree, young branches tomentose the older glabrous, leaves membranous, 10-18 by 2.5-4.0 cm, oblong-lanceolate acute or obtuse. Flowers are 2-4, on lateral pedicles, pedicles about 12 mm long elongating and becoming thick and woody in fruit. The fruit is astringent, sweet, and useful in blood complaints. It alleviates biliousness and thirst, and aggravates "Vata" and "Kapha" (Ayurveda). Unripe and dried fruits are used in diarrhea and dysentery. Leaves are considered insecticide, anthelmentic and externally useful as suppurant. Leaves used against inflammation and tumor and also exhibited intropic positive chronotropic and spasmolytic activities. Root bark contains alkaloid, liriodenine and oxoushinsunine anonaine, michelalbine and reticuline.[1-5]. The phytochemical studies revealed the presence of alkaloids, phytosterol, fixed oil and fats, phenolic compounds and tannins, proteins and amino acids, flavonoids.

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The availability of seeds is much and collection of the plant material is easy. Based on the above facts, the seeds of *Annona reticulata* was selected for the study. This study reports the effects of extract of *Annona reticulata* seeds against pyloric ligation induced ulcer model in (Shay) rats.

## EXPERIMENTAL

### Materials

The seeds of *Annona reticulata* were collected in Tiruchirappalli District where the plant is cultivated under natural conditions and authenticated the same.

### Preparation of plant extract

The seeds of *Annona reticulata* were dried at shade at room temperature, pulverized by a mechanical grinder are sieved through 40 mesh. The powdered materials were extracted with ethanol using Soxhlet extraction apparatus. The extract was concentrated under reduced pressure. The ethanol free semi-solid mass thus obtained was used for phytochemical studies and antiulcer activities. 5% Acacia mucilage was used as vehicle at a dose of 1 mL/Kg.

Adult albino rats of either sex weighing between 100-130 g were used. The animals were deprived of food for 24 hours before the commencement of the experiment, but allowed free access to water 24 hours. The rats were placed in cages provided with meshed aluminum floor to avoid caprophagy [UL-49].

### Pyloric ligation induced ulcer

The albino rats were divided into 4 groups with each 6 individuals in a group The drug was given orally 2 hours prior to pyloric ligation, which was carried out according to techniques of Shay et. al[6]. The first group served as control (received 5% acacia mucilage), second group served as standard (received 20 mg/Kg) third group received seed extract *Annona reticulata* (50 mg/Kg) while the fourth group received seed extract *Annona reticulata* (100 mg/Kg).

After the administration of the prescribed dose, the animals were sacrificed after 6 hours, their stomach were opened to collect the gastric juice, centrifuged and its pH and volume were measured; the total acidity was estimated by titration method and pH was checked by pH meter and the gastric ulcer lesions were observed as described by Gupta et al[7]. The gastric lesions were counted and mean ulcerative index was calculated. The sum of

the length (mm) of all lesions for each stomach was used as the ulcer index (UI) and the inhibition percentage was calculated from the following formula [(UI control - UI treated /UI control) x 100][8]. The statistical significance between the group was analyzed using student's 't' test.

**Possible mechanism of action[8]**

The ethanolic extract of *Annona reticulata* seeds decreased the ulcer index significantly. The activity may be due to inhibition of acid and pepsin secretions and their *in vitro* ability to bind these. This suggests that it shows antiulcerogenic effect, which may be due to decrease of acid and pepsin outputs, which enhance gastric mucosal strength.

## RESULTS AND DISCUSSION

The effect of ethanolic extract of seeds of *Annona reticulata* and femotidine on pylorus ligation induced ulcer model was observed (Table 1) and this study indicated that the ethanolic extract of seeds of *Annona reticulata* ($p < 0.001$) reduced significantly total gastric volume secretion, ulcer score, total acidity and has potent activity against gastric ulcers in rats.

**Table 1. Effect of ethanolic extract of seeds of *Annona reticulata* in pylorus ligation gastric ulcer in rats**

| Group | Design treatment | Dose mg/kg | Total volume of gastric secretion (mL/100 g) | Total acidity (meq/L/100 g) | pH | Ulcer score |
|---|---|---|---|---|---|---|
| 1. | Control (5% Acacia mucilage) | | 2.1 ± 0.08 | 92 ± 6.3 | 1.1 ± 0.06 | 33.4 ± 2.8 |
| 2. | Standard (Femotidine) | 20 | 0.5 ± 0.04** | 27 ± 1.9 | 4.3 ± 0.08** | 10.5 ± 1.4** |
| 3. | Test drug 1 (Ethanol extract of seeds of *Annona reticulata*) | 50 | 0.7 ± 0.01* | 39 ± 1.9 | 3.4 ± 0.36* | 12.6 ± 1.4* |

| Group | Design treatment | Dose mg/kg | Total volume of gastric secretion (mL/100 g) | Total acidity (meq/L/100 g) | pH | Ulcer score |
|---|---|---|---|---|---|---|
| 4. | Test drug 2 (Ethanol extract of seeds of *Annona reticulata*) | 100 | 0.6 ± 0.03** | 31 ± 3.7** | 4.0 ± 0.12** | 11.2 ± 2.9** |

N = 6, *p < 0.01 vs control, **p < 0.001 vs control, when compared to control values expressed as Mean ± SEM.

The rats in the control group had large ulcer perforation, where as the rats administered with ethanolic extract of seeds of *Annona reticulata* produce significant reductions in ulcer index when compared to control. Cimetidine antagonized pentagastrin, histamine, and carbachol induced hyper acidity in gastric fistula rats[9]. It protects experimental animals from gastric ulceration induced by stress, pyloric ligation, aspirin and related compounds[10]. Several studies indicated that reduced gastric secretory volume, acidity and ulceration, which may be probably due to reduced histaminergic mechanism by $H_2$ receptor blockade as like cemitidine.

From this study, it can be concluded that the ethanolic extract of seeds of *Annona reticulata* has the protection against experimental gastric ulcer models. The antisecretory effect of ethanolic extract could probably contribute antiulcer activity. The study results confirm the antiulcer effect of seeds of *Annona reticulata*.

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