# EVALUATION OF ANTIULCER ACTIVITY OF *IPOMOEA STAPHYLINA*

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**Summary**

The ethalonic extract of leaves of *Ipomoea staphylina* (Convolvulaceae) was investigated for its antiulcer activity in wistar rats. *Ipomoea staphylina* (500 mg/kg, p.o) or ranitidine (50 mg/kg p.o) in pylorus ligation induced gastric ulcer method, the ethanol extract of *Ipomoea staphylina* showed significant reduction in gastric volume($P<0.01$), free acidity ($P<0.001$), total acidity ($P<0.001$) and ulcer score ($P<0.001$) as compared to control (Table-1). In ethanol induced ulcers in rats, the ethanol extract of *Ipomoea staphylina* showed significant reduction in gastric lesion ($P<0.001$).

*Keywords*: *Ipomoea staphylina*, Convolvulaceae, Ranitidine, Antiulcer, Free acidity, Total acidity.

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## Introduction

Gastric hyperacidity and ulcer are very common causing human suffering today. It is an imbalance between damaging factors within the lumen and protective mechanisms within the gastro duodenal mucosa. Although prolonged anxiety, emotional stress, hemorrhagic surgical shock, burns and trauma are known to cause severe gastric irritation, the mechanism is still very poorly understood. Oxygen derived free radicals have been implicated in the pathogenesis of a wide variety of clinical disorders and gastric damage is caused by physical, chemical and psychological factors that leads to gastric ulceration in human and experimental animals. Most of the available drugs are thought to act on the offensive factors which neutralize acid secretion like antacids, H2 receptor blockers like ranitidine, famotidine, anticholinergics like pirenzepin, telezipine, proton pump blockers like omeprazole, lansoprazole, etc. which interfere with acid secretion[1].

*Ipomoea staphylina* is a herb belonging to family Convulvulaceae. A literature review did not reveal any information about its pharmacological study. In the present study, an attempt has been made to elucidate the antiulcer activity of *Ipomoea staphylina*.

## Materials and methods

### *Plant Material*

The fresh leaves *Ipomoea staphylina* were collected from local area of Bangalore, Karnataka, identified and authenticated by Dr. Ravi, Foundation for Revitalisation of Local Health Traditions, Bangalore. The fresh leaves of *Ipomoea staphylina* were isolated and dried under shade at room temperature for seven days and powdered The powder was extracted with ethyl alcohol to get a yield of 12.5 % w/w. Dried extract dissolved in distilled water was used for the study. Phytochemical test of the extract indicated the presence of flavonoids, alkaloids, saponins, proteins and phytosterols.

### *Experimental animals*

Thirty male albino wistar rats weighing 150-200 g were purchased from (National Institute of Mental Health and Neuro Science) NIMHANS Bangalore. The animals were housed in polypropylene cages maintained in controlled temperature (27 ± 2°C) and light cycle (12h light and 12 h dark) and fed with standard rat pellet diet (Amrut rat and mice feed, India) and water *ad libitum.*. The animals were given a week's time to get acclimatized with the laboratory conditions. All the experimental procedures were performed according to the committee for the purpose of control and supervision of experiments on animals (CPCSEA), ministry of social justice and empowerment Government of India, norms and approved by the Institutional Animal Ethics Committee (IAEC). The oral acute toxicity study was performed using the up & down procedure (OPPTS guidelines).

### *Pylorus ligation induced gastric ulcer in rats*[2]

The wistar albino rats weighing 150-200 g of either sex were divided into 3 groups, each group consists of 6 animals. Animals were provided with standard rodent pellet diet and the food was withdrawn 18-24h before the experiment though water was allowed ad libitum. All the experiments were performed in the morning according to current guidelines for the case of laboratory animals and care was taken to avoid coprography.

Animals were anaesthetized using ketamine (65 mg/Kg), the abdomen was opened and pylorus ligation was done without causing any damage to its blood supply. The stomach was replaced carefully and the abdomen wall was closed in two layers with interrupted sutures. The animals were deprived of water during the post-operative period. After 4h, stomachs were dissected out and cut open along the greater curvature and ulcers were scored by a person unaware of the experimental protocol in the glandular portion of the stomach. The gastric content was titrated against 0.01N NaOH using toffer's reagent as an indicator (Table1).

***Ethanol Induced Ulcers in rats*[3]**

The gastric ulcers were induced in rats by administrating 100% ethanol (1ml/200g) and the animals were sacrificed by cervical dislocation and stomach was incised along the greater curvature and examined for ulcers. The ulcer index was scored, based upon the product of length and width of the ulcers in the glandular portion of the stomach (square millimeters per rat) (Table 2).

***Statistical analysis***

Data were statistically analyzed as mean ±SE and expressed as non-significant P>0.05, just significant P<0.05 and significant P<0.01as case ay be using ANOVA followed by Dunnett's t-test.

## Results

**Table 1. Effect of *Ipomoea staphylina* ethanol extract on gastric secretion, acidity, $P^H$ and ulcer score in pylorous ligated rats**

| Treatment (mg/kg.bw) | Volume of gastric secretion (ml/100g) | Free acidity (mEq/L/100g) | Total acidity (mEq/L/100) | $P^H$ | Ulcer Score |
|---|---|---|---|---|---|
| Vehicle Control (normal saline 2 ml) | 7.53±0.25 | 25.15±0.63 | 65.48±1.38 | 2.06±0.13 | 3.00±0.18 |
| Ranitidine (50mg/kg, p.o) | 5.73±0.20** | 12.26±0.47** | 33.11±.66** | 3.35±0.21* | 1.41±0.15** |
| *Ipomoea staphylina* (500 mg/kg, p.o) | 6.11±0.25* | 14.66±0.72** | 40.53±.91** | 2.95±0.24# | 1.83±0.21* |

Values expressed as mean ±SEM, n=6;

**P<0.001 considered statistically significant as compared to vehicle control group

*P<0.01 considered statistically significant as compared to vehicle control group

#P<0.05 considered statistically significant as compared to vehicle control group

**Table 2. Effect of *Ipomoea staphylina* ethanol extract against ethanol induced gastric lesion in mice**

| Treatment (mg/kg.bw) | Gastric lesion ( Mean± SEM) | Ulcer Inhibition (%) |
|---|---|---|
| Control (100% ethanol, 1ml/200g) | 20.66±0.88 | ---- |
| Ranitidine (50mg/kg, p.o) | 3.16±0.13* | 84.70 |
| *Ipomoea staphylina* (500 mg/kg, p.o) | 1.56±0.24* | 92.44 |

Values expressed as mean ±SEM, n=6;
*P<0.001 considered statistically significant as compared to control group

From the screening results it was observed that, in pylorus ligation induced gastric ulcer method, the ethanol extract of *Ipomoea staphylina* showed significant reduction in gastric volume(P<0.01), free acidity(P<0.001), total acidity (P<0.001) and ulcer score(P<0.001) as compared to control (Table-1). In ethanol induced ulcers in rats, the ethanol extract of *Ipomoea staphylina* showed significant reduction in gastric lesion (P<0.001).

## Discussion

Gastric ulcers result from imbalance between aggressive factors and the maintenance of mucosal integrity through endogenous mechanism[4]. The excessive gastric formation by prostaglandin includes both increases the mucosal resistance as well as decrease in aggressive factors, mainly acid and pepsin[5]. The ethanol extract of *Ipomoea staphylina* was evaluated for antiulcer activity against pylorous ligation and ethanol induced animal models. The various parameters like gastric secretion,free acidity, total acidity, ulcer index, gastric lesions were evaluated. In pylorous ligation ulcers are due to accumulation of gastric acid in the stomach and the ethanolic extract of *Ipomoea staphylina* posses its antiulcer activity in pylorous ligation model is most probably due to antisecratory mechanism.

Ethanol induced ulcer are more predominant in the glandular part of the stomach stimulates 5-lioxygenase pathway or breakdown of reactive oxygen species resulting in the damage of gastric mucosa[6]. The ethanolic extract of *Ipomoea staphylina* posses its antiulcer activity in ethanol induced ulcer model is most probably due to inhibition of those avobe mechanisms.

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