

## Evaluation of Antiulcer Activity by Using Flower Extract of *Ctenolepis garcini* in Aspirin Induced Rats

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### ABSTRACT

Peptic ulcer is a hole in the gut lining of the stomach, duodenum, or esophagus. An ulcer occurs when the lining of these organs is corroded by the acidic digestive juices that are secreted by the stomach cell. The objective of the present study is to evaluate the effects of plant extracts of *ctenolepis garcini* whole plant on gastric ulcer

**Methodology:** the study is conducted with 16 animals divided into four groups of four each at random. All drugs were administered orally. The first group served as a control and was administered vehicle only, second group served as a positive control and were treated with standard drug ranitidine. Third and fourth group served as test groups. Drugs and vehicle were administered 30 minutes before the administration of aspirin. Ulcer induction is observed with aspirin after six hours. When all rats were killed by using anesthetic ether and their stomachs dissected out. The parameters taken to assess volume of gastric secretion,  $p_H$ , free acidity, total acidity and ulcer index were estimated in the aspirin induced gastric ulcers in albino rats.

**Keywords:** *Ctenolepis garcini*, peptic ulcer.

### INTRODUCTION

In thousands of years the herbal medicines are used. Peptic ulcer disease is ulceration of the mucous membrane of the stomach, duodenum or esophagus. Ulcer is a form of lining of the digestive system decomposed by acid digestive juices and pain full. Peptic ulcer disease is imbalance between gastro duodenal mucosal defense mechanisms and the aggressive factors, particularly gastric acid and pepsin.

Peptic ulcer disease causes 15000 deaths occur in every year. It is very common in India, the Indian pharmaceutical industry have 6.2 billion rupees drugs share of antacids and antiulcer drugs and occupy 4.3% of the market share. Nowadays gastrointestinal disorders are the universal problem. Many people increase the stress due to the modern life style and consumed

with fast foods. Women's are affect peptic ulcer in 9.5% and men's are affected by 10.5%. 30 to 55 years people mainly suffered in duodenal ulcers.

Many antiulcer drugs are available in the market such as  $H_2$  receptor antagonist, proton pump inhibitors, 5-HT<sub>4</sub> receptor antagonist, cytoprotectant, healing agents etc. some adverse effects these drugs are cardiac arrhythmia, blood dyscrasias, hypertension, central nervous system, and gastro intestinal disturbances, nephritis, impairment of sexual drive, hepatitis, pancreatitis, increased liver enzyme activity and triglycerides, leucocytopenia, and thrombocytopenia, pharyngitis, pruritus, and electrolyte imbalance. Anti-ulcer drugs are with less or no side effects.

*Ctenolepis garcini* (family: cucurbitaceae) it is commonly known as

Garcins bur cucumber widely distributed in India. It has been used to treat a variety of common disorders used in liver diseases, and joint pains. Main chemical constituent of fruit is hydroxycitric acid is used to prevent fat storage, control appetite, increase exercise endurance. Many favorable effects are human health such as weight loss, exercise performance.

There are some reports showing the hepatoprotective activity, anticancer activity, antibacterial activity, antifungal activity and anti-inflammatory activity of *Ctenolepis garcini*.

## MATERIALS AND METHODS

### Plant material

The *Ctenolepis garcini* were collected from the local area of Hyderabad and identified and authenticated by Dr. Munawwar Husain Kazmi director of central research institute of unani medicine, New Delhi. Voucher specimen no (SMPU/CRI-Hyd13194) have been kept in central research institute of Unani Medicine, New Delhi.

### Experimental animals

Albino rats were weighing between 140-200gms. Wister rats were taken into Sainath Agencies, Bapujinagar, Hyderabad. They were exporting animals in an AC vehicle in water and food facility very caring to transporting. The animals acclimatized for seven days. In laboratory conditions of temperature 27 degrees centigrade  $\pm$ 1 degree centigrade. 12: 12 hours light dark conditions for animal house.

### Extraction

The fresh leaves were washed under running tap water. Air dried under shed for 3 days and were ground to fine and stored in polythene containers at room temperature and further used. The sample was analyzed chemically to detect the phytochemical. About 60g of the each powdered test material was placed on to a soxhlet apparatus and fractioned sequentially in 200 ml of ethanol over 6-12hrs and the extraction was continued until the liquid

was clear. The extracts obtained was distilled and concentrated under the reduced pressure using Rota evaporator to dryness and residue was used for the biochemical analysis.

### Preliminary phytochemical studies

The phytochemical screening carried out on ethyl extract of *Ctenolepis garcini* indicates the presence of phytochemical constituents such as Alkaloids, flavonoids, tannins & phenolic compounds Carbohydrates, glycosides and steroids.

### Acute toxicity studies

Acute oral toxicity test was carried out as per OECD guidelines 423. Female albino rats were used for acute toxicity study. The animals were kept on overnight fasting and provided water ad libitum. The test drug *Ctenolepis garcini* was administered in orally 100mg/kg & 200mg/kg. The dose of the test drug was observed by fasted body weight. After the drug has been administered, food was withheld with further two hours. The dose administered was observed any toxic effect. If mortality was observed in two out of three animals. The animals were observed any toxic effect within 72 hours.

### Screening procedure

#### Aspirin induced ulcers in rats

Animals were divided into four groups, with each group containing six animals. The first group served as a control and was administered vehicle only, second group served as a positive control and were treated with standard drug ranitidine (20mg/kg) third and fourth group served as test groups and were administered at the dose level 100 and 200mg/kg. Plant extract administered for 7 days. After seven days aspirin were administered 30 minutes before 200mg/kg per orally. After 6 hours rats will be sacrificed by anesthesia. Stomachs were dissected out for determination of gastric lesions, washed in tap water and examined ulcers with the help of microscope (10x). Gastric juice collected into centrifuge tubes and centrifuged at 1000 rpm for 10 minutes. The gastric juice volume will be noted. Gastric juice of  $P_H$  was recorded by  $P_H$

meter. Ulcer score for each animal called as ulcer index. Free and gastric acidity were analyzed.

### Statistical analysis

Statistical analysis was carried out by using ANOVA followed by Dunnett's multiple comparison tests using Graph pad PRISM software version 4.03 (2003). P values <0.05 were considered significant.

## RESULTS

### Acute toxicity study

In acute toxicity study, mortality and toxicity studies are not observed. The test drug *Ctenolepis garcini* was safe in orally up to the dose level 200mg/kg. No major behavior changes were noted during the study.

### Aspirin induced ulcer model in rats:

Aspirin induced ulcer model significant in ulcer index ( $2.92 \pm 0.137$ ), free acidity ( $38.75 \pm 1.493$ ), Total acidity ( $52.75 \pm 4.02$ ), Gastric pH ( $4.96 \pm 0.18$ ), Gastric volume ( $4.02 \pm 0.11$ ).

Standard drug significantly condensed ulcer index ( $0.6 \pm 0.06$ ), Free acidity ( $13.75 \pm 1.75$ ), Total acidity ( $19.25 \pm 1.25$ ), Gastric pH ( $1.84 \pm 0.14$ ), Gastric volume ( $1.94 \pm 0.06$ )

Plant extracts 100mg/kg, 200mg/kg low and high reduced changes were occurred. Significantly ulcer index is ( $1.30 \pm 0.083$ ,  $0.79 \pm 0.117$ ), Free acidity ( $16.5 \pm 1.84$ ,  $12.75 \pm 1.108$ ), Total acidity ( $36.5 \pm 2.53$ ,  $23.75 \pm 1.75$ ), Gastric pH ( $3.12 \pm 0.14$ ,  $4.56 \pm 0.18$ ), Gastric volume ( $3.56 \pm 0.16$ ,  $2.40 \pm 0.14$ ).

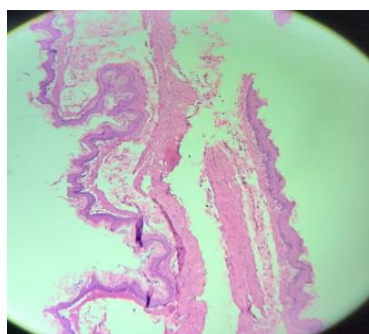
### Effect of Ethanolic extract of *Ctenolepis garcini* in aspirin induced ulcer model in rats

Groups	Treatment	Ulcer Index	Total Acidity	Free Acidity	Gastric Volume	Gastric pH
1	Normal Control	—	$13.5 \pm 2.69$	$6.00 \pm 1.87$	$1.88 \pm 0.02$	$1.84 \pm 0.14$
2	Ulcer Control	$2.92 \pm 0.137$	$52.75 \pm 4.02$	$38.75 \pm 1.493$	$4.02 \pm 0.11$	$1.84 \pm 0.14$
3	Standard	$0.6 \pm 0.06$	$19.25 \pm 1.25$	$13.75 \pm 1.75$	$1.94 \pm 0.06$	$4.96 \pm 0.18$
4	<i>Ctenolepis Garcini</i> 100mg/kg	$1.30 \pm 0.083$	$36.5 \pm 2.53$	$16.5 \pm 1.84$	$3.56 \pm 0.16$	$3.12 \pm 0.14$
5	<i>Ctenolepis Garcini</i> 200mg/kg	$0.79 \pm 0.117$	$23.75 \pm 1.75$	$12.75 \pm 1.108$	$2.40 \pm 0.14$	$4.56 \pm 0.18$

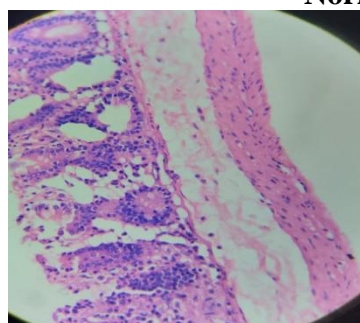
Results are expressed as Mean SEM (n=6)

\*P<0.05 as compared to control

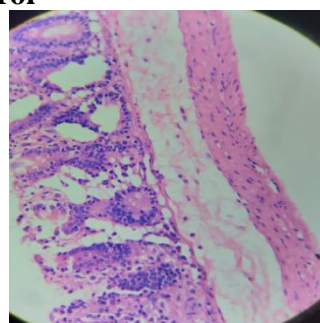
### Histopathology Results



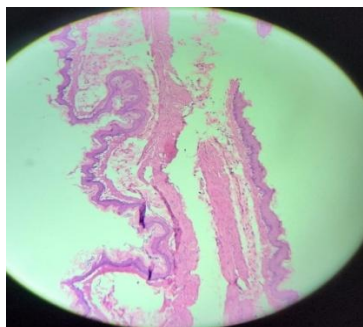
Normal control



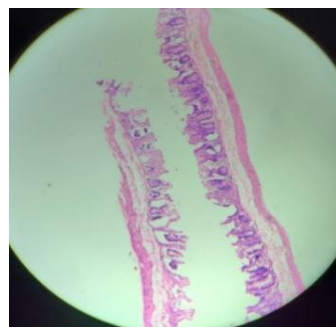
Ulcer control



Standard



**Ctenolepis garcini 100mg/kg**



**Ctenolepis garcin200mg/kg**

## DISCUSSION

Gastric acid is an important role for the gastric ulceration in aspirin induced ulcer model in rats. In this method the accumulation of gastric juice in the stomach causes ulceration. Gastric acid secretion is regulated by many factors including vagal activity, cholinergic, histaminergic and gastrinergic neurotransmissions, the activities of various post synaptic receptors and the proton pump inhibitors. Various therapeutic agents including plant extracts are used to inhibit the gastric acid secretion, mucosal defense mechanisms by increasing mucosal invention, alleviating the surface epithelial cells. Treatment of gastric ulcers including Anti acids, proton pump inhibitors, anticholinergic, and histamine H2 receptor antagonist are used. Drugs may produce adverse reactions such as gynecomastia, thrombocytopenia, nephrotoxicity, and hepatodiagnocity. Stress causes an ischemic condition in the gastric mucosa by activation of parasympathetic and sympathetic nervous system it indicates vasoconstriction. It causes free radical generation. Aspirin which is prostaglandin synthase inhibitor, it producing ulcers by preventing secretion of mucin and bicarbonate and impaired mucosal blood flow. Ranitidine is a H2 blocker which blocks the H2 receptors & inhibits the gastric acid secretion. It decreases both gastric volume and acid content of gastric juice.

## CONCLUSION

The experimental studies an animal model confirmed the protective and curative

activities of the *C.garcini* against gastric ulceration compared with dose of ranitidine used as standard drug. *C.garcini* of both doses 100 & 200mg/kg shows anti-ulcer activity but dose response observed at 200mg/kg and ranitidine results the similar to the plant dose. It significantly *C.garcini* decreased gastric ulceration in aspirin induced model rats.

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