



ANTI-ULCER EFFECTS OF THE AQUEOUS EXTRACT OF *AGERATUM CONYZOIDES* LINN. IN ASPIRIN PLUS PYLORIC LIGATION INDUCED ULCER IN ALBINO RATS.

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ABSTRACT

The antiulcer effects of aqueous of *Ageratum conyzoides* was studied in aspirin plus pyloric ligation induced ulcer in albino rats. Animals were divided into 4 groups of 6 animals each Group I(control) received 1ml/200g of 2%gum acacia in distilled water, Group II(standard)- omeprazole 2mg/kg bodyweight), Group III (sub group I) received test drug 200mg/kg bodyweight, (sub group II) received test drug 400mg/kg bodyweight and all the groups received aspirin 200mg/kg bodyweight. All the drugs were suspended in 2% gum acacia in distilled water and given orally at a uniform volume of 1ml/200 gram daily for 5 days before pyloric ligation. The anti ulcer effects was evaluated by four parameters i.e ulcer index, pepsin activity, free and total acidity and gastric barrier mucus secretion. The test drug shows significant anti ulcer effects when compared with the control. The study shows that the aqueous extract of *Ageratum conyzoides* Linn have antiulcer effects which may be due to the presence of flavonoids in the plant.

KEY WORDS : *Ageratum conyzoides* L, antiulcer, Aspirin, Pyloric ligation



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INTRODUCTION

Plants are an integral part of human life and civilization from time immemorial. Most of the present day drug molecules were derived from the active molecules found in plants of traditional system of medicine.¹ Drugs of herbal origin have been used in traditional system of medicine such as unani and ayurveda since ancient times.² According to WHO more than 80% of the world's population relies on traditional herbal medicine for their primary healthcare.³ Although herbal medicine has existed since the dawn of time, our knowledge of how plants actually affect human physiology remains largely unexplored.⁴ "Peptic ulcer disease" is commonly used to refer to ulcerations of the stomach, duodenum, or both, but peptic ulcer can develop in any portion of the gastrointestinal tract that is exposed to acid and pepsin in sufficient concentration and duration.⁵ Peptic ulcers are focal defects in the gastric or duodenal mucosa that extend into the submucosa or deeper. They may be acute or chronic and are caused by imbalance between the offensive (acid, pepsin and *H.pylori*) and defence factors (mucin, prostaglandin, bicarbonate, nitric oxide, and growth factors). The large majority of peptic ulcers are caused by *H.Pylori* infections and NSAIDs. Peptic ulcer disease impairs the quality of life and is associated with increased morbidity and mortality.⁶ Drugs of both herbal and synthetic origins are coming up and are offering newer and better options for treatment of peptic ulcer disease. The type of drugs range from proton pump inhibitors to H₂ antagonists or cytoprotective agents. At the same time, clinical evaluation of these drugs has shown evidences of relapse from simpler to severe side effects like arrhythmias, impotence, gynaecomastia, hyperplasia and hematopoietic changes and also drug interactions.⁷ *Ageratum conyzoides* belongs to the family *Asteraceae*, tribe *Eupatoreieae* has been known since ancient times for its curative properties and has been used in folk remedies for treatment of various ailments such as burns and wounds, for antimicrobial properties diarrhea, headache and

dyspnoea, pneumonia, analgesic, anti-inflammatory, antiasthmatic, antispasmodic and haemostatic effect, stomach ailments, and other skin diseases.⁸ *Ageratum conyzoides* is called Goat Weed in English, in Hindi Uchunti and Khongjainapi in Manipuri.⁹ The present study was undertaken to evaluate the antiulcer effects of aqueous extract of *Ageratum conyzoides* Linn (AEAC) in suitable experimental animals models.

MATERIALS AND METHODS

Animals

Healthy albino rats of either sex weighing 100-200grams were procured from Central animal house, RIMS. The animals were maintained at standard conditions of 24-27° c and humidity of 60-65%. Twelve hours dark and light cycle was maintained. The experiment was carried out in accordance with the guidelines of the CPCSEA and the study was approved by the institutional animal ethics committee.

Plant collection and authentication

Fresh aerial parts of the plant was collected from Lamphel area in the month of July and August 2011 and it was authenticated by Prof.P.KUMAR Singh, Dept. of Life Sciences,,Manipur University.

Plant extraction

The plant was cleaned and air dried under shade, powdered by an electrical mixture grinder and 50grams of the powder was extracted with distilled water using a soxhlet apparatus The yield obtained after extraction was 20 %.

ACUTE TOXICITY TESTING

The acute toxicity testing was done as per OECD guidelines 423¹⁰ on albino rats of either sex. The dose level to be used as the starting was selected as 2000mg/kg. The 24 hrs toxicity testing was recorded to identify the toxic dose of aqueous extract of *Ageratum conyzoides*.No toxicity was seen at dose of 5000mg/kg. Two

doses 200mg and 400mg were selected for the study.

Aspirin plus pyloric ligation method

Twenty four healthy albino rats of either sex, weighing 100-200 gm were randomly divided

into four groups of six animals each and fed with standard laboratory diet with water ad libitum. All the drugs were suspended in 2% gum acacia and were administered for 5 days at a uniform volume of 1 ml/200gm of body weight as follows:-

Table 1
Drugs given single dose once daily, per orally (1ml/200g /kg) for 5 days

Groups	At 0 hour	After 30 mins
I(Control)	2% gum acacia 1ml/200mg	Aspirin 200mg/kg
II(Standard)	Omeprazole 2mg/kg	Aspirin 200mg/kg
III(TEST I)	Aq extract of <i>Ageratum conyzoides</i> L	Aspirin 200mg/kg
IV(TEST II)	Aq extract of <i>Ageratum conyzoides</i> L	Aspirin 200mg/kg

On the 6th day pylorus was ligated under light ether anesthesia. The animals were fasted overnight before pylorus ligation. Four hours after ligation, the animals were sacrificed by high dose of ether. The stomach was opened along the greater curvature and the contents collected in graduated test tubes and centrifuged (2000 rpm for 10 minutes). The supernatant fluid was subjected to biochemical analysis.¹¹ The antiulcer activity was evaluated by ulcer index¹², pepsin activity¹³, gastric barrier

mucus¹⁴, free and total acidity¹³. Ulcer index =10/X, where X is the area of the glandular portion of the stomach divided by the area of ulceration in mm² scale. The pepsin activity and the free and total acidity were determined by the method described by Debnath PK et al¹³. The gastric barrier mucus by the method described by Corne SJ et al¹⁴. The analysis of results was performed by one way ANOVA followed by Dunnetts' t test and the value of p<0.01 was considered significant.

Table 2
Shows the effect of aqueous extract of *Ageratum conyzoides* L on ulcer index, pepsin activity, gastric barrier mucus secretion, free and total acidity.

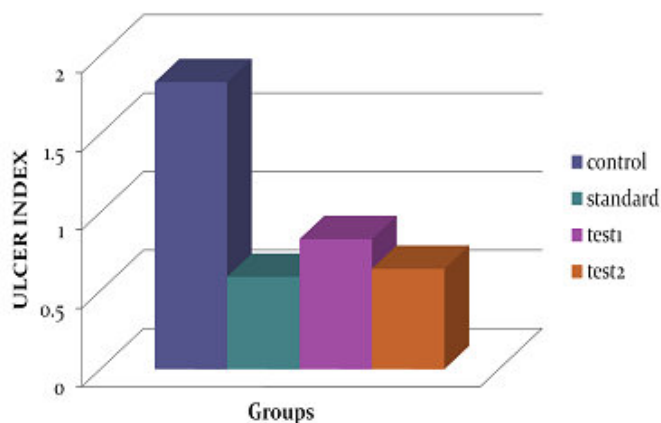
Groups	Treatment for 5days p.o.(1ml/200gm)	Ulcer index	Pepsin activity(μ moltyrosine/ml)	Gastric mucus barrier(μ g alcian blue/gm)	Free Acidity (mEq/l)	Total acidity (mEq/l)
I(control)	2%gum acacia + aspirin (200 mg/kg)	1.83 \pm 0.02	223.41 \pm 11. 53	31.24 \pm 1.55	42.33 \pm 1.6	77.77 \pm 3.10
II(standard)	Omeprazole 2mg/kg +aspirin (200mg/kg)	0.59 \pm 0.26*	53.30 \pm 5.24*	66.66 \pm 2.65*	17.83 \pm 0.97**	56.2 \pm 3.3**
III(test I)	Aq. Extract 200mg/kg +aspirin (200 mg/kg)	0.83 \pm 0.04*	106.59 \pm 4.26*	45.13 \pm 1.55*	21.52 \pm 1.6**	61.33 \pm 1.8*
IV(test II)	Aq extract 400mg/kg+aspirin (200mg/kg)	0.64 \pm 0.09*	75.34 \pm 2.25*	50.92 \pm 2.65*	20.33 \pm 1.30**	57 \pm 3.50**

Values are mean \pm SEM;n=6 in each group.

*P<0.01 **p<0.001when compared to control in each group (one way ANOVA followed by Dunnetts' t test)

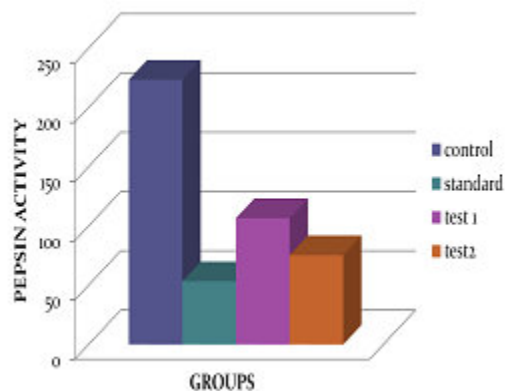
GRAPH 1

Showing effect of aqueous extract of Ageratum conyzoides L on ulcer index



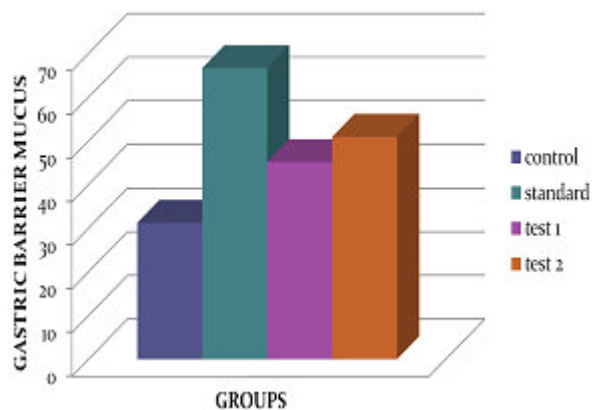
Graph 2

Showing effect of aqueous extract of Ageratum conyzoides L on pepsin activity



Graph 3

Showing effect of aqueous extract of Ageratum conyzoides L on gastric barrier mucus



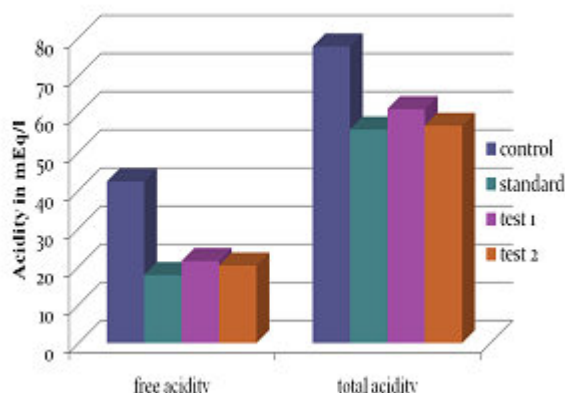
Graph4**Showing effect of aqueous extract of *Ageratum conyzoides* L on free and total acidity****RESULTS**

Table 2 and graph 1-4 : showed that the test drug at both doses decreased the ulcer index significantly ($p < 0.01$) when compared to the control group. There was a highly significant decrease in the pepsin activity of both the test groups ($p < 0.01$ when compared to control. Effect was dose dependant, higher dose (400mg/kg) showing more effect than lower dose. Omeprazole showed similar effect but was more effective compared to both the doses of the test drug. Gastric barrier mucus secretion was significantly ($p < 0.01$) increased in a dose dependant manner when compared to the control. The test drug produced highly significant ($p < 0.001$) reduction in the free and total acidity compared to the control. The test drug shows dose dependent decrease in the total acidity compared to the control. the higher dose (400mg/kg) showing more effect than lower dose (200mg/kg).

DISCUSSION

The pylorus ligation induced ulcers are thought to be caused due to increased acid or pepsin in the stomach. The essential criteria which determines the status of mucosal defence barrier against offensive assault of acid pepsin is the quality and quantity of mucus secretion. Increased mucosal secretion by the gastric

mucosal cells can prevent gastric ulceration by several mechanism including lessening stomach friction during peristalsis and acting as effective barrier to the back diffusion of hydrogen ions.¹⁵ The protection afforded by AEAC against gastric ulcers induced by aspirin + pyloric ligation may be due to the suppression of acid and pepsin levels and stimulation and strengthening of mucosa barrier.¹⁵ Phytochemical screening of *Ageratum conyzoides* Linn showed the presence of mono- and sesquiterpenes, flavonoids, triterpenoids, sterols, alkaloids, coumarins, essential oils, tannins, saponins, phenols and etc. Among the flavonoids, kaempferol and quercetin are present.⁽¹⁶⁾ In the present study the aqueous extract of *Ageratum conyzoides* L was investigated for its antiulcer activity in aspirin plus pyloric ligation induced ulcer in albino rats. The extract at doses 200mg and 400mg/kg significantly decreased the ulcer index ,pepsin activity, free and total acidity when compared to respective controls. It also significantly increased the gastric barrier mucus when compared to control.

CONCLUSION

The present study shows that the aqueous extract of *Ageratum conyzoides* Linn. has anti-ulcer activity in aspirin plus pyloric ligation induced ulcer in albino rats. The antiulcer

activity may be due the presence of flavonoids. Further studies will have to be carried out to

identify the active molecule responsible for its antiulcer activity.

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