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ANTI-ULCER ACTIVITY OF THE AQUEOUS EXTRACT OF *PORTULACA RACEA* L.IN ASPIRIN PLUS PYLORIC LIGATION INDUCED ULCER IN ALBINO RATS.

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ABSTRACT

The anti-ulcer activity of the aqueous extract of *Portulaca oleracea* L. was studied in aspirin plus pylorus ligation induced ulcer in albino rats. Eighteen healthy albino rats were divided into 3 groups of six animals each group. Group I (control) received 1ml/200 gram of 2% gum acacia, Group II (standard) received omeprazole 2 mg/kg body weight, Group III received the test drug i.e, the extract at 500 mg/kg body weight, and all groups received aspirin (200 mg/kg body weight). 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 activity was evaluated by four parameters i.e, Ulcer Index, pepsin activity, free and total acidity, and gastric barrier mucus secretion. The extract shows significant anti-ulcer activity when compared with the control and comparable efficacy with the standard. This study shows that the aqueous extract of *Portulaca oleracea* L. has significant anti-ulcer activity.

KEYWORDS*: Portulaca oleracea* **L., Anti-ulcer, Aspirin, Pyloric ligation.**

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INTRODUCTION

Peptic ulcer occurs in that part of the gastrointestinal tract which is exposed to gastric acid and pepsin. It results due to an imbalance between aggressive (acid, pepsin, bile and *H. pylori*) and defensive factors (gastric mucus, prostaglandin, bicarbonate, nitric oxide and innate resistance of mucosal cells)[1]. NSAIDS are very frequently associated with peptic ulcers (in up to 60% of patients). Topical injury by the luminal presence of the drug appear to play a minor role in the pathogenesis of these ulcers, but the effects of these drugs are instead mediated systemically.[2] *Portulaca oleracea* is a prostrate, widely branched glabrous succulent, annual herb. It is found in gardens and in open waste lands. *Portulaca oleracea* is called 'Purslane' in English, 'Khursa' in hindi and 'Leibak kundo' in Manipuri. It belongs to the family *Portulacaceae*. It is used for many health problems like kidney and bladder problems, it relieves dry cough, shortness of breath, it cures inflammed eyes, mouth sores and swollen gums. The plant has been used for expulsion of intestinal worms etc.[3] The present study was undertaken to evaluate the antiulcer activity of aqueous extract of *Portulaca oleracea* L. (AEPO) in suitable experimental animals models.

MATERIALS AND METHODS

The study was approved by the Institutional Animal Ethics Committee, Regional Institute of Medical Sciences, Imphal.

Animals

Healthy albino rats of either sex weighing 100-200 grams were used and fed with standard laboratory diet with water *ad libitum*. Twelve hours dark and light cycle was maintained.

Preparation of plant extract

Fresh aerial parts of the plant were collected from Lamphel area in the month of July and August 2010 and it was authenticated by Prof. P. Kumar Singh, Dept. of Life Sciences, Manipur University. The plant was cleaned and air dried under shade, powdered by a mixture grinder and 50 grams of the powder was extracted with distilled water using Soxhlet apparatus[4]. The yield obtained after extraction was 20 %.

Aspirin plus pyloric ligation method

Eighteen healthy albino rats were divided into 3 groups of 6 rats in each. They were fed with standard laboratory diet and water *ad libitum*. Twelve hours dark-light cycle was maintained. The drugs were suspended in 2% gum acacia in distilled water and administered daily at a uniform volume of 1ml /200 grams for 5 days as follows:-

Table 1

Drugs Given a single dose, per orally (1 ml / 200 gm / day) for 5 days.		
Group	**At '0' hour**	**After 30 minutes**
I (control)	2% gum acacia, 1ml/ 200 gm	Aspirin, 200 mg/kg
II (standard)	Omeprazole, 2 mg/kg	Aspirin, 200 mg/kg
III (test)	Aq. extract of *Portulaca oleracea* L. 500 mg/kg	Aspirin, 200 mg/kg

On the sixth day, after 24 hours fasting, pylorus was ligated under light ether anaesthesia. Four hours after ligation, the animals were sacrificed and the stomachs were removed and opened along the greater curvature. The contents were collected in graduated test tubes and centrifuged (2000 r.p.m. for 10 minutes). The supernatant was then subjected to biochemical analysis[5]. The antiulcer activity was evaluated by four parameters-ulcer index [6], pepsin activity[7], free and total acidity [7], gastric barrier mucus secretion[8]. Ulcer Index= 10/X; where X= area of the glandular portion of stomach divided by area of ulceration in mm^2 scale.The analysis of results was performed by one way ANOVA followed by Dunnett's ' t' test and value of $p<0.05$ was considered as significant.

RESULTS

Table 2

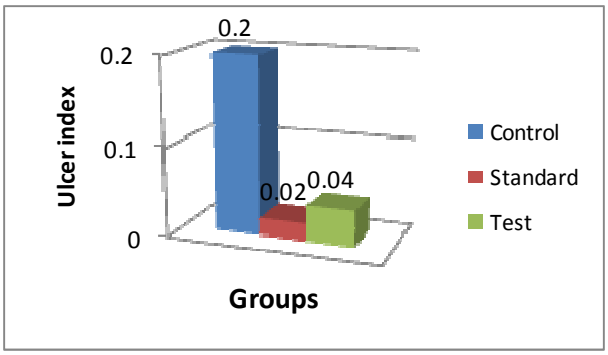
Shows the effect of aqueous extract of Portulaca oleracea L. on ulcer index, pepsin activity, gastric barrier mucus secretion, free and total acidity.

Group	Treatment for 5days p.o.(1ml/ 200gm)	Ulcer index	Pepsin activity(µmol tyrosine/ml)	Gastric mucus barrier(µg alcian blue/gm)	Free Acidity (mEq/l)	Total acidity (mEq/l)
I(control)	2%gum acacia + aspirin (200 mg/kg)	0.2±0.013	237.2±5.3	30.9±1.02	43.83±0.82	83.2±3.4
II(standard)	Omeprazole 2mg/kg +aspirin (200mg/kg)	0.02±0.003*	58.9±3.14*	64.82±0.96*	21.83±0.8*	57.2±1.2*
III(test)	Aq. extract 500mg/kg +aspirin (200 mg/kg)	0.04±0.004*	115.96±1.71*	49.8±1.6*	23.2±0.7*	63.7±1.8*

All values are expressed as mean ± SEM; n=6 in each group.
****P<0.001compared to control (One way ANOVA followed by Dunnett's't' test).***

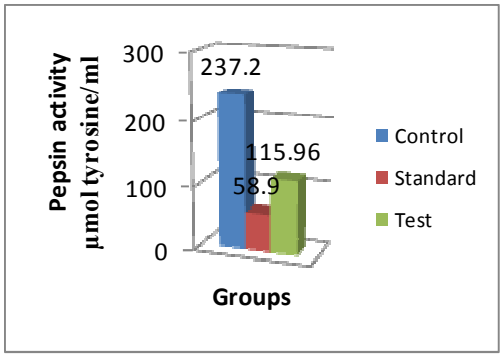
Graph 1

Effect of AEPO on ulcer index in aspirin plus pyloric ligation induced ulcer model in albino rats.



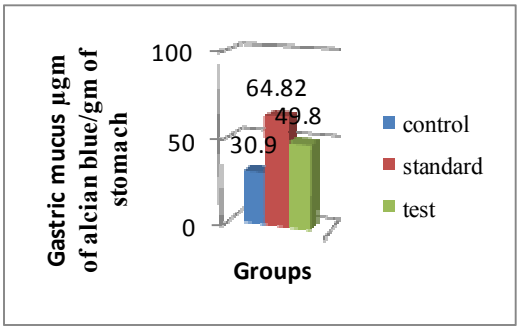
Graph 2

Effect of AEPO on Pepsin activity in aspirin plu pyloric ligation Induced ulcer model in albino rats.



Graph 3

Effect of AEPO on gastric barrier mucus secretion in aspirin plus pyloric ligation induced ulcer model.



Graph 4

Effect of AEPO on free and total acidity in the aspirin plus pyloric ligation induced ulcer model

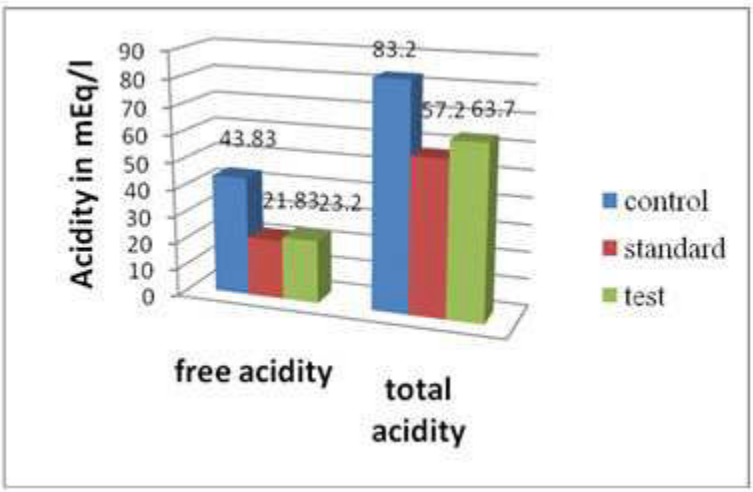


Table 2 and graph 1-4: Showed that the test drug at 500mg/ kg dose decreased the ulcer index highly significantly ($p<0.001$) when compared to the control group. The test drug showed significant decrease in the pepsin activity ($p<0.001$) when compared to control and was also found to possess highly significant effect in increasing the gastric barrier mucus secretion ($p<0.001$). Free and total acidity were also highly significantly ($p<0.001$) reduced by the test drug when compared to the control. These effects of the test drug were comparable with that of the standard drug.

DISCUSSION

In the present study, the aqueous extract of *Portulaca oleracea* L. was investigated for its antiulcer activity in aspirin plus pyloric ligation induced ulcer in albino rats. The extract at a dose of 500 mg/kg significantly decreased the ulcer index, pepsin activity and free and total acidity when compared to their respective controls. It also significantly increased the gastric mucus barrier when compared to control.

CONCLUSION

The present study shows that the aqueous extract of *Portulaca oleracea* L. has anti-ulcer activity in aspirin plus pyloric ligation induced ulcer in albino rats. The anti-ulcer activity of the plant may be due to the presence of flavonoids. Five flavonoids, namely, kaempferol, apigenin, myricetin, quercetin and luteolin were identified in different parts of the plant *Portulaca oleracea* by phytochemical studies.[9] Further study is required to determine the mechanism of action of the plant and to open the gateway for potential drug development in the future.

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