Research Article
CODEN (USA): IJPLCP

[Madhulatha *et al.*, 4(3): March., 2013]
ISSN: 0976-7126

INTERNATIONAL JOURNAL OF PHARMACY & LIFE SCIENCES

Anti-ulcer activity of *Pisonia aculeata* on Pylorus ligation induced gastric ulcer in rats

Ch. Madhulatha*, P. Sharaish, G. Kalyani, G.S.Sushma, N.Siva Subramanian and B. Archana Devi
Department of Pharmaceutical Chemistry, Teegala Krishna Reddy College of Pharmacy,
Medbowli, Meerpet, Saroornagar, Ranga reddy, (A.P.) - India

Abstract
The present study was performed in pylorus ligation induced gastric ulcer model in albino rats in which ability of different leaf extracts of *Pisonia aculeata* was tested in at dose level of 100 & 200mg/kg body weight orally and compared with Ranitidine (30mg/kg) as standard. From the results it is concluded their various leaf extracts of *Pisonia aculeata* at 200mg/kg dose level showed significant anti ulcer activity when compared to that of standard.

Key-Words: *Pisonia aculeata*, Pylorus ligation, Anti-ulcer activity

Introduction
Peptic ulcer is worldwide problem and its prevalence is quite high in India. Several field studies from different part of our country suggest its occurrence in 3-10 per thousand populations. Peptic ulcer is a condition where benign lesions of gastric or duodenal mucous occur at a site where the mucosal epithelium is exposed to acid and pepsin. Gastric ulcers are caused due to imbalance between offensive and defensive factors of the gastric mucosa.[1]

Herbal medicines have recently attracted much attention as alternative medicines useful for treating or preventing life style related disorders and relatively very little knowledge is available about their mode of action. There has been a growing interest in the analysis of plant products which has stimulated intense research on their potential health benefits.[2]

In the present study we selected a plant namely *Pisonia aculeata* belongs to the family Nyctaginaceae. It is one such plant used by the tribes and native medical practitioners to treat various ailments including liver disorders, inflammation , swelling, cough and tumours.[3] From the literature survey, *Pisonia aculeata* possess anti-tumour, anti-tubercular, protective effect, hepatoprotective and anti-oxidant activity. Hence an effort was made to investigate the anti-ulcer activity of various extracts of leaf of *Pisonia aculeata.*

*** Corresponding Author**
Email: ch.madhulatha45@gmail.com
Mob. +91-8522811731

Material and Methods
Plant material and extraction: The plant specimens for the proposed study were collected from Tirumala hills, Tirupathi. The plant was authenticated by Dr. Madhava Chetty, Department of Botany and specimen herbarium were preserved at Sri Venkateshwara university library. The leaves were separated from other parts, washed, cleaned and dried it was powdered mechanically and stored for further use.

Preparation of Extract
The 500 gms of coarsely powdered plant material of *Pisonia aculeata* leaf were defatted with petroleum ether and extracted successively with ethyl acetate and ethanol (90%) using soxhlet apparatus. The extraction was carried out until the extractive becomes colourless. The extract was filtered through a cotton plug, followed by whattman filter paper (no.1). The extract was evaporated under reduced pressure using rotary vaccum evaporator.

Animals
Male albino rats (150-200 g) are selected. The animals were deprived of food for 24 hours, before the commencement of experiments, but water allowed at *ad libitum*. The study was conducted after obtaining institutional animal ethical committee clearence.

Acute toxicity studies
The acute toxicity study was carried out by the method of smith(1960) in wistar albino rats.

Anti-ulcer activity
The albino rats are weighing between 150-200g were divided into VI groups each of 6 animals.After the fasting period the rats were anaesthetized with di ethyl ether. The abdomen was opened and the pyloric end

was ligated with a thread. All the samples were given 60 minutes prior to pyloric ligation.[4,5]

Group-I received 1% CMC (1ml/kg,p.o.) act as a control. Group-II received Ranitidine (30 mg/kg, p.o.) act as a standard. Group-III received *Pisonia aculeata* ethyl acetate extract (100mg/kg, p.o). Group IV received *Pisonia aculeata* ethyl acetate extract (200 mg/kg, p.o).[6] Group-V received *Pisonia aculeata* 90% ethanolic extract (100mg/kg, p.o.). Group VI received *Pisonia aculeata* 90% ethanolic extract (200mg/kg, p.o).

After 4 hours of pyloric ligation all the animals were sacrificed to observe gastric lesions.The gastric juice was collected and centrifuged at 1000 rpm for 10 minutes. The volume of gastric juice (ml) as well as pH of gastric juice was noted[7].The gastric ulcer score was recorded according to the method described by Aguwa and Ukme(1997).Gastric content were assayed for total acidity by titration against 0.01N NaOH using phenophthalein as indicator. The volume of gastric content was measured and the total acidity and free acidity were estimated [8].

Statistical analysis

The values were expressed as mean ± SEM. Statistical analysis was performed by one way analysis of variance (ANOVA) followed by Tukey multiple comparison test and data on liver weight variations were analyzed using Student's 't' test. P values less than 0.001 Vs control were considered significant.

Results and Discussion

In present study the preliminary chemical test reveals the presence of flavonoids, terpenoids, saponins, tannins, alkaloids, etc. The result of oral administration of all the ethyl acetate and 90% alcoholic extracts at 100 & 200mg/kg b.w on different chemical parameters in rats represented Table-1.

All the extracts showed the decrease in gastric juice volume on comparision to control group and indicated their anti-secretary effort. But 90% ethanolic extract (200mg/kg) showed significant effect on that of ranitidine (30mg/kg) in reducing the gastric juice volume (Fig.1).

Compared to control group all the test extract showed elevation in p^H indicating their capacity to reduced the acidity of the gastric juice. The 90% ethanolic extract at 200mg/kg indicates almost equipotent effect on that of ranitidine (Fig.2).

Gastric free acidity is increased in control animals due to pylorus ligation. Various extracts of *Pisonia aculeata* at 200mg/kg decreased the gastric free acidity when compared to standard. The 90% ethanolic extract showed similar effect that of standard in reducing the gastric free acidity. (Fig.3).

Various extracts of *Pisonia aculeata* showed decrease in total acidity as compared to control (Fig.4). The ethyl acetate and 90% ethanolic extract at 200mg/kg reduced the mean ulcer score respectively (Fig.5). Percentage curative ratio of 90% ethanolic extract at 200mg/kg was almost comparable to that of standard (Fig.6).

Conclusion

The anti gastric ulcer activity of *Pisonia aculeata* leaf extracts in pylorus ligation model is evident from its significant reduction in gastric volume, free acidity, total acidity, ulcer score and increase in p^H when compared to that of standard drug. The anti-gastric ulcer activity of 90% ethanolic extract at 200mg/kg is more significant than that of ethyl acetate extract at 200mg/kg. Thus it has been scientifically proven that these extracts possess energy potential as an anti-ulcerogenic agent.

Acknowledgement

The authors are thankful to management of Teegala Krishna Reddy College of Pharmacy encouraging and providing research required facilities.

References

1. Narayan, S., R.S Devi, M. Jainu ''Protective effect of Polyherbal drug, ambrex in ethanol – induced gastric mucosal lesions in experimental rats". *Ind J Pharmacol* ., 36,2004, (34-37).
2. Pushpagadan P, "Ethanopharmacological approaches to wound healing exploring medicinal approaches to wound healing exploring medicinal plants". Journal ethanopharmacology, 2007, (103-13).
3. Liogier HA. Descriptive Flora of Puerto Rico and Adjacent Islands. 1985; 1:352.
4. Bhave, A.L., J.D. Bhatt and K.G. Hemavathy, 2006. Anti ulcer effect of amlodipine and its interaction with H2 blocker and proton pump inhibitor in pylorus ligated rats. Indian J. Pharmacol., 38: 403-407.
5. Kath, R.K. and R.K. Gupta, 2006. Antioxidant activity of hydro alcoholic leaf extract of ocimum sanctum in animal models of peptic ulcer. Indian J. Physiol. Pharmacol., 50:391-396.
6. Shay, H., S.A. Komarov, S.S. Fels, D. Meranze, M. Gruenstein and H. Siplet, 1945. A simple method for the uniform production of gastric ulceration in the rat. Gastroenterology, 4:43-61.
7. Ramachandran, S., J.U. Prathima, S.M. Shaheedha, S. Nandhakumar and M.D. Dhanraju, 2008. Antioxidant activity of leaf

extracts of acalypha indica in animal models of gastric ulcer, natural products. Indian J., 4: 230-232.

8. Kulkarni, S.K., 1985. Handbook of Experimental Pharmacology. 3rd Edn., VallabhPrakashan,NewDelhi.

Table 1: Effect of PAL extracts against pylorus ligation induced gastric ulcer in rats

Group	Treatement and Dose(mg/kg)	Gastric volume (ml)	p^H	Free acidity (mEq/l)	Total acidity (mEq/l)	Ulcer Score	% Inhibition
I	Control 1ml/kg	6.52±0.12	1.85± 0.14	25.91±0.06	58.6 ±0.3	3.54±0.56	---
II	Ranitidine 30mg/kg p.o	2.36±0.07	4.56± 0.12	9.45 ± 0.02	21.76±0.24	0.74± 0.12	82.8***
III	PALEAE 100mg/kg p.o	5.02±0.12	2.78±0.13	18.67±0.06	49.35±0.32	2.34± 0.56	42.68*
IV	PALEAE 200mg/kg p.o	4.26±0.16	3.5 ± 0.16	18.43±0.03	52.24±0.06	1.74± 0.32	59.42**
V	PALETE 100mg/kg p.o	4.65±0.21	3.84± 0.14	17.47±0.08	37.65±0.08	2.08± 0.12	72.24**
VI	PALETE 200mg/kg p.o	3.34±0.14	3.98± 0.18	14.42±0.07	30.34±0.21	1.24± 0.16	79.56***

Values are Mean ± SEM; n=6; ***P<0.001 Vs control.

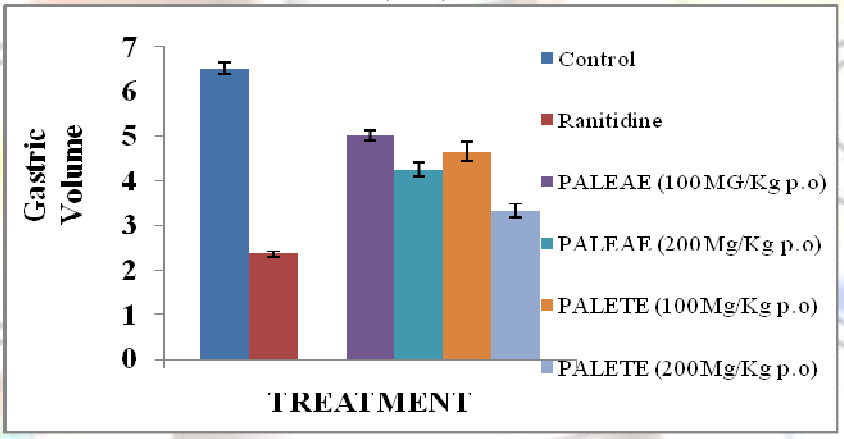

Fig.1: Effect of PAL extract on Gastric Volume

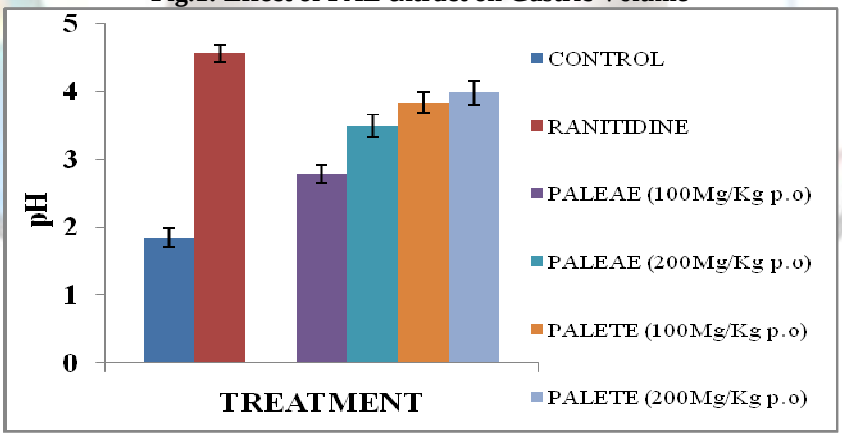

Fig. 2: Effect of PAL extract on Gastric pH

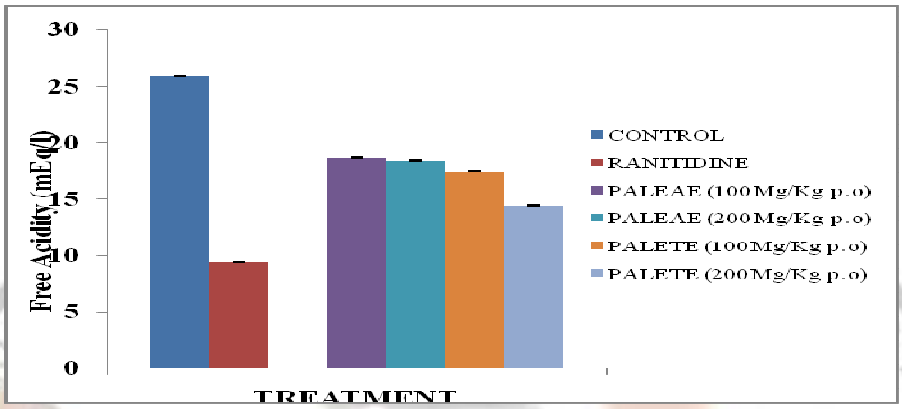

Fig. 3: Effect of PAL extract on Free Acidity

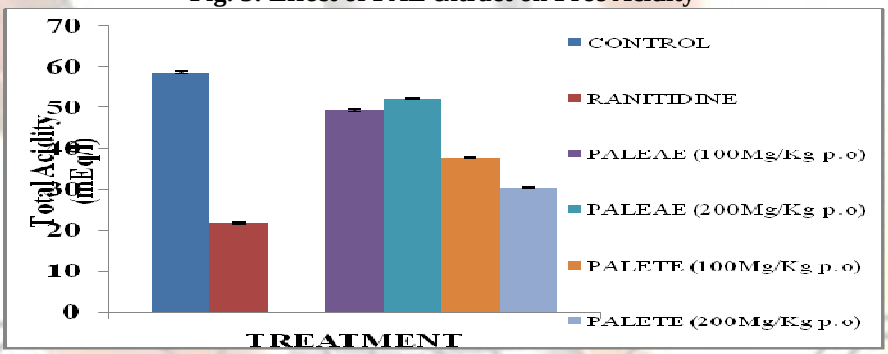

Fig. 4: Effect of PAL extract on Total Acidity

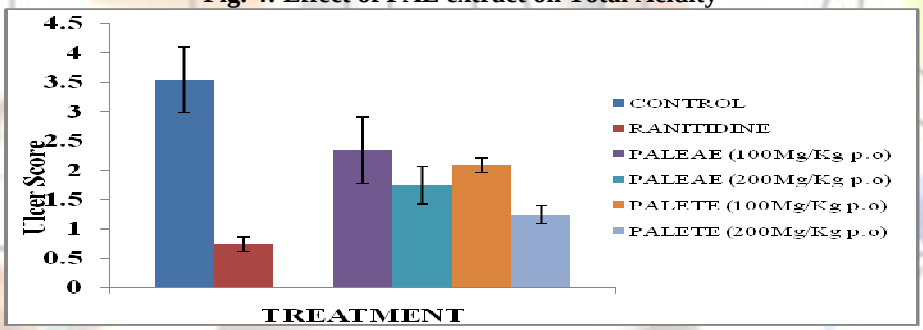

Fig. 5: Effect of PAL extract on Ulcer Score

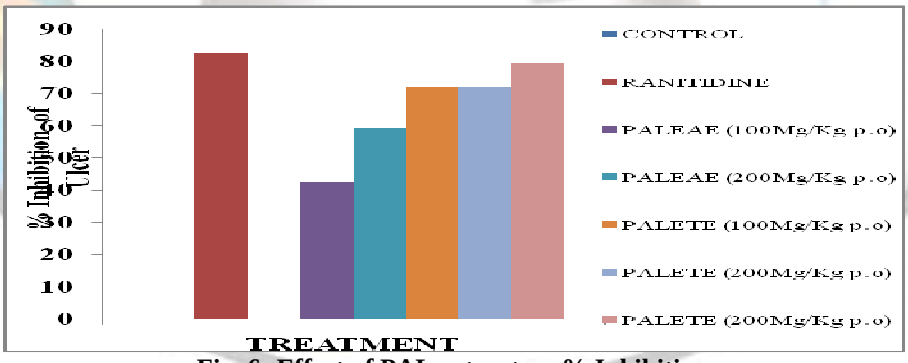

Fig. 6: Effect of PAL extract on % Inhibition