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Anti gastric ulcer activity of *Plectranthus amboinicus (Lour)* in wistar albino rats

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ABSTRACT

The present investigation was performed in pylorus ligation-induced ulcer model in wistar albino rats in which ability of different extract of Plectranthus amboinicus (Lour) was tested in at dose level of 200mg/kg body weight orally and compared with Ranitidine (30mg/kg) as standard. From the results it is concluded that the various extract of Plectranthus amboinicus (Lour) (200mg/kg) showed highly significant anti-ulcer activity.

Key Words: *Plectranthus amboinicus (Lour),* pyloric ligation, anti-ulcer activity.

INTRODUCTION

Peptic ulcer is worldwide problem and its prevalence is quite high in India. Several field studies from different parts of our country suggest its occurrence in 3 to 10 per thousand populations. The exact cause of peptic ulcer is not known, the disease results in chronic suffering, loss of working hours and occasional fatality. Smoking, alcoholism and spices add to the severity of the disease that often precipitate serious complication of ulcer. Herbal medicine is fast emerging as an alternative treatment to available synthetic drugs for treatment of ulcer possibly due to lower costs, availability, fewer adverse effects and perceived effectiveness. In the present study we

selected a plant namely *Plectranthus amboinicus (Lour)* belongs to the family *lamiaceae.* It is one such plant used traditionally for its curative property in treating fever, asthma, ulcer, inflammatory disorder. From the literature survey, *Plectranthus amboinicus(Lour)* possess fungitoxic[1], anti-bacterial [2], anti-malarial[3], anti-inflammatory[4], hepatoprotective and diuretic activity[5]. Hence an effort was made to investigate the anti-ulcer acitivity of various extract of whole plant of *Plectranthus amboinicus (Lour).*

EXPERIMENTAL SECTION

The whole plant of *Plectranthus amboinicus (Lour)* collected from the Chennai was authenticated by Dr. P. Jayaraman, Ph.D., Plant Anatomy Research Centre, Chennai. Tamilnadu. The material was air dried under shade, powdered mechanically and stored in air-tight container. About 1 kg of powdered material was extracted with ethyl acetate, ethanol and aqueous by cold maceration method for 72 hrs.

Animals

Wistar Albino rats (150-200mg) of either sex were used in this investigation. They were maintained at standard housing condition and fed with commercial diet (Hindustan lever ltd., Bangalore) and provided with water *ad libitum* during the experiments. The Institutional Animal Ethical Committee having reference Number IAEC/CPCSEA/PHA/23-08 permitted the study.

Acute toxicity studies

The acute toxicity study was carried out by the method of smith (1960) in wistar albino rats [6].

Anti-ulcer activity

The albino rats of either sex weighing between 150-200g were divided into 5 groups of 6 animals. The animals were deprived of food for 24 hours, before the commencement of experiments, but water allowed at *ad libitum*. After the fasting period the rats were anaesthetized with light ether. The abdomen was opened and the pyloric end was ligated with a thread [7]. All the samples were given 60 minutes prior to pyloric ligation [8].

Group-I received distilled water (1ml/kg, p.o) act as a control, Group-II received Ranitidine (30 mg/kg, p.o.) act as a standard, Group-III received ethanolic extracts (200 mg/kg, p.o) and Group-IV received ethyl acetate extract (200mg/kg, p.o), Group-V received aqueous 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 [9]. Then the gastric juice was subjected to biochemical estimation [10]. The gastric ulcer score was recorded according to the method described by Aguwa and Ukwe (1997) [11].

Gastric content were assayed for total acidity by titration against 0.01N NaOH using phenolphthalein as indicator. The volume of gastric content was measured and the total acidity and free acidity were estimated [12]. The data concerning the pH, acid secretion were analyzed

by One-Way analysis of variance (ANOVA) and followed by student't' test were show in Table-1[13].

RESULT AND DISCUSSION

In present study the preliminary chemical test reveals the presence of flavonids, terpenoids, saponins, steroids, tannins, proteins, carbohydrates & volatile oil in the whole plant of *Plectranthus amboinicus (Lour).* The results of oral administration of all the ethanolic, ethyl acetate and aqueous extracts at 200mg/kg b.w. on different chemical parameters in rats were represented Table 1.

Table 1: Anti-ulcer activity of various extracts of *Plectranthus amboinicus (Lour)* against pylorus ligation induced gastric ulcer in albino rats

Group	Treatment and Dose mg/kg	Gastric volume (ml)	pH	Free acidity (mEq/l)	Total acidity (mEq/l)	Ulcer score	% Inhibition of ulcer
I	**Control Distilled water ml/kg**	9.79±0.012	2.1±0.012	19.91±0.012	46.35±0.012	2.75±0.25	-
II	**Standard Ranitidine 30mg/kg p.o**	4.65±0.012***	3.7±0.012***	7.75±0.012***	21.71±0.012***	0.625±0.124*** P<0.001	77.27
III	**ethanolic extract 200mg/kg p.o**	4.25±0.012***	3.7±0.012***	7.07±0.012***	20.45±0.012***	0.75±0.144*** P<0.001	72.72
IV	**ethyl acetate extract 200mg/kg, p.o**	5.85±0.012***	NS 3.5±0.012	17.95±0.012***	32.25±0.012***	1.75±0.478* P<0.05	36.36
V	**Aqueous extract 200mg/kg, p.o**	5.29±0.012***	2.9±0.012***	11.31±0.012***	24.59±0.012***	1.5±0.288** P<0.01	45.45
One way ANOVA	**F D.F**	95 4,15	30.14 4,15	213.12 4,15	934.16 4,15	8.96 4,15	-

Values are given as mean ±S.E.M
N=6 (animals are used in each group.)
****P<0.001, * *P<0.01, *P<0.05, NS- Non Significant as compared to control*
One way ANOVA followed by student't' test

All the extracts showed the decrease in gastric juice volume on comparison to control group and indicated their anti secretory effect. But ethanolic extract (200mg/kg) showed almost similar effect as that of ranitidine (30mg/kg) in reducing the gastric juice volume. (Fig-1)

Compared to control group all the test extract showed elevation in pH indicating their capacity to reduced the acidity of the gastric juice. The ethanolic extract at 200mg/kg indicated almost equipotent effect as that of ranitidine. (Fig-2)

Fig-1: Effect of various extracts of *Plectranthus amboinicus (Lour)* on gastric volume level against pylorus ligation induced gastric ulcer in albino rats

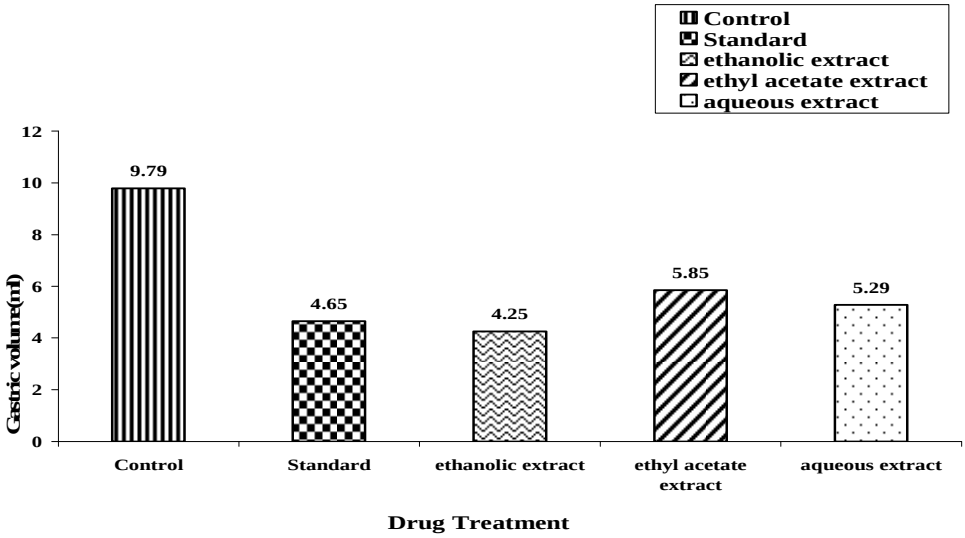
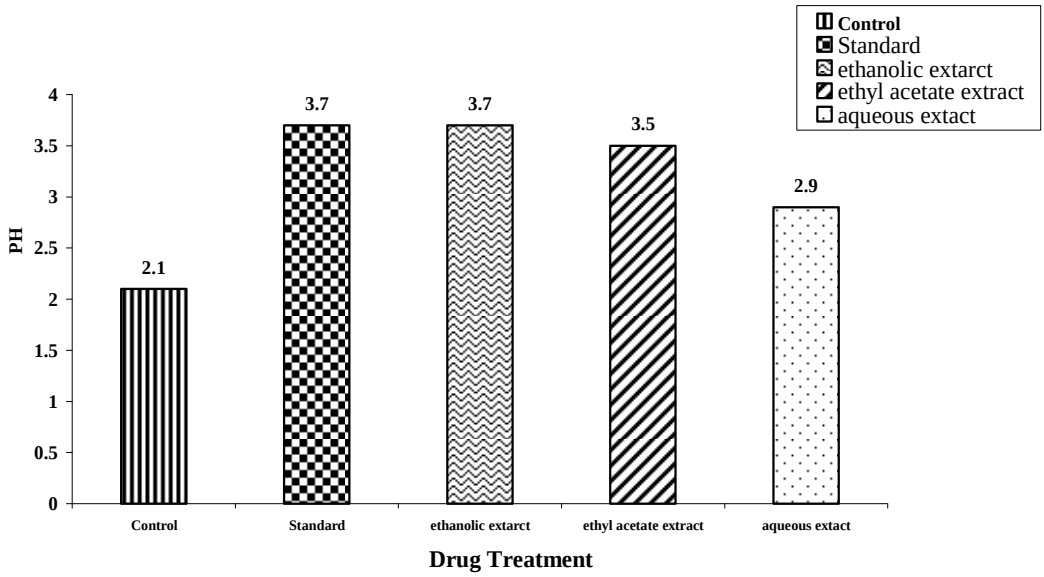
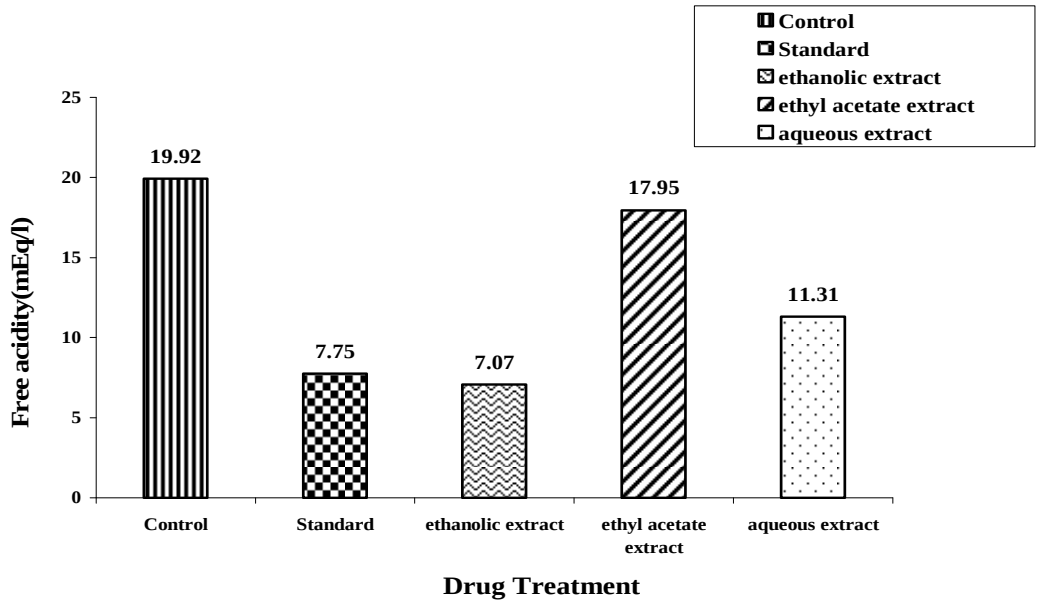


Fig-2: Effect of various extracts of *Plectranthus amboinicus* (Lour) on pH level against pylorus ligation induced gastric ulcer in albino rats



Gastric Free acidity is increased in control animals due to pylorus ligation. Various extracts of *Plectranthus amboinicus (Lour)* at 200mg/kg decreased the gastric free acidity respectively. When compared to ranitidine effect, ethanolic extract showed equipotent effect in reducing the gastric free acidity. (Fig-3)

Fig -3: Effect of various extract of *Plectranthus amboinicus (Lour)* on free acidity level against pylorus ligation induced gastric ulcer in albino rats



Various extracts of *Plectranthus amboinicus (Lour)* showed decrease in Total acidity as compared to control.(Fig-4) The ethanolic, ethyl acetate and aqueous extracts at 200mg/kg reduced the mean ulcer score respectively (Fig-5) and percentage curative ratio of ethanolic extract at 200mg/kg was almost comparable to that of standard ranitidine (Fig-6).

Fig -4: Effect of various extract of *Plectranthus amboinicus (Lour)* on Total acidity level against pylorus ligation induced gastric ulcer in albino rats

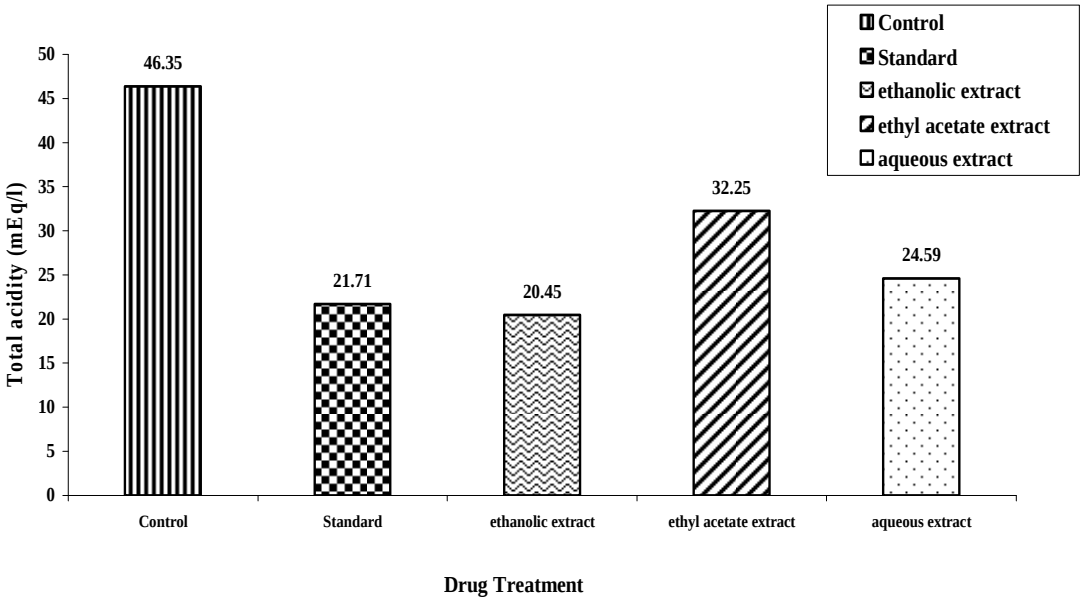


Fig -5: Effect of various extract of *Plectranthus amboinicus (Lour)* on ulcer score against pylorus ligation induced gastric ulcer in albino rats

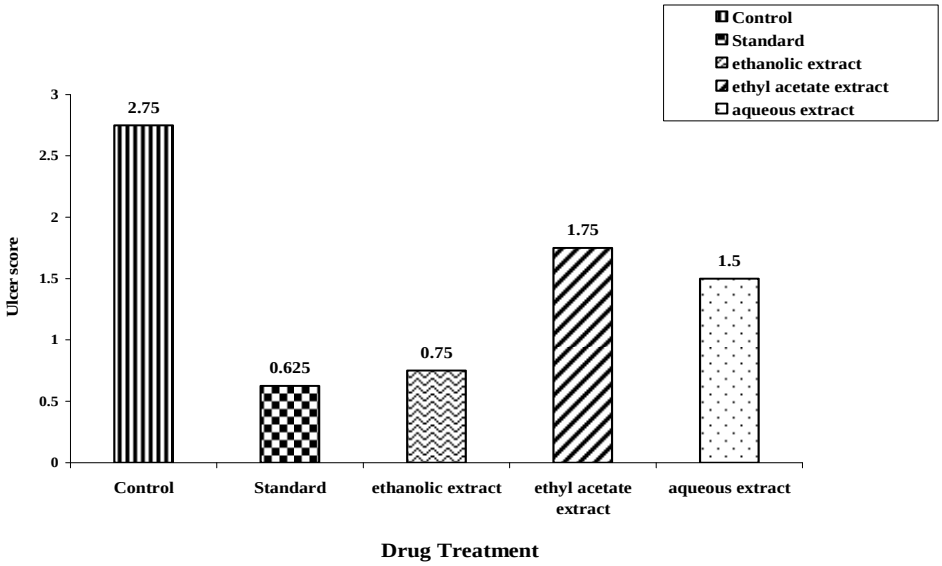
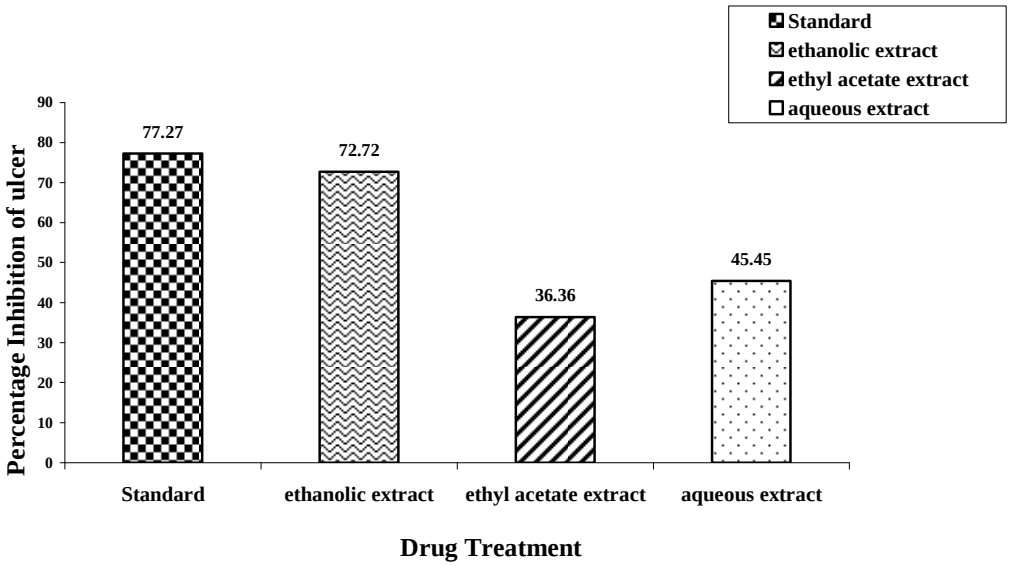


Fig-6: Effect of various extract of *Plectranthus amboinicus (Lour)* on ulcer curative ratio level against pylorus ligation induced gastric ulcer in albino rats



CONCLUSION

Administration of various extract of P*lectranthus amboinicus (Lour)* showed significant anti-ulcer activity in pylorus ligated rats at dose level of 200mg/kg/p.o which was comparable with standard drug ranitidine (30mg/kg/p.o) thus it has been scientifically proven that these extract possess enough potential as an anti-ulcerogenic agent.

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