



SCREENING OF HYDRO-ALCOHOLIC EXTRACT OF FRUITS OF *LUFFA CYLINDRICA* LINN. ON ASPIRIN PLUS PYLORUS LIGATED RAT MODEL: FOR ITS ANTI-ULCER ACTIVITY

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Abstract:

The traditional systems of treatment such as Ayurveda, Unani, and Siddha, western herbal medicine, traditional Chinese medicine and homeopathy use herbs for the treatment. Many researchers has prescribed about the importance of herbal medicine in the treatment of various diseases and because of the accessibility and cost effectiveness herbal treatment is still in practice by large number of practitioners. *Luffa cylindrica* Linn. (Curcubitaceae) fruits was reported to possess a number of medicinal properties including used as immunostimulant, anti-inflammatory, anti-tumour, antibacterial and antifungal and anti-viral activities and also induce uterine contraction to hasten child birth (Oxytocics). The present study was investigated the anti-ulcer activity of hydroalcoholic extracts of fruits of *luffa cylindrica* Linn by using aspirin plus pylorus ligated model at the dose of 100 and 200 mg/kg. The results were showed significantly ($p < 0.01$) decreased in ulcer index (1.31 ± 0.33) and gastric volume (2.18 ± 0.74) when compared with control (3.92 ± 0.27) and (5.85 ± 0.12) respectively at the dose of 200 m/kg and also showed significant effect when compared with omeprazole (standard) at 2mg/kg. In this study concluded that the hydroalcoholic extract of fruit of *luffa cylindrica* act as anti-ulcer activity due to presence of alkaloids and flavonoids.

Key words: hydroalcoholic, aspirin plus pylorus ligation and *Luffa cylindrica*(L).fruits.

Introduction

Gastric ulcer is a lesion caused by increased oxidative stress, neutrophil infiltration and decrease in blood flow, necrosis and inflammation (Silva et al., 2013). It occurs due to an imbalance between aggressive injurious factors (Pepsin, HCl) and defensive mucosa protective factors (prostaglandins, mucus and bicarbonate barrier and adequate blood flow). Besides, stress, smoking, (Levenstein et al., 2014) nutritional deficiencies, prolonged ingestion of nonsteroidal-anti-inflammatory drugs (NSAIDs)

(Belaiche et al., 2002) and *Helicobacter pylori* infection are all relevant etiological factors for the development of gastric ulcer. (Beltran et al., 2014)

Currently the treatment of gastric ulcer is based on the inhibition of gastric acid secretion by H₂-antagonists, such as ranitidine; or proton-pump inhibitors, such as omeprazole. (Vault et al., 2009) Furthermore, side effects such as osteoporosis, hypergastrinemia and hyperplasia of enterochromaffin-like cells (ECL) are common in the prolonged therapy with antisecretory drugs. In recent years, focus on plant research has increased worldwide and several studies had showed immense potential of medicinal plants. (Dahanurkar et al., 2000) Herbal medicines derived from plant extract, are increasingly being recognized in treating various clinical diseases, with relatively little knowledge of their modes of action. (Begum et al., 2008) *Luffa cylindrica* (L.) fruit is commonly called sponge gourd, loofa, vegetable sponge, bath sponge or dish cloth gourd, is a member of cucurbitaceous family. The Plant is widely distributed throughout India.

In view of the above, the search for new antiulcer treatments is essential, focusing mainly on the search for agents that promote effective healing of gastric ulcer. The present study was carried out using the aspirin plus pylorus ligated experimental model. The aim of the study was to investigate the effectiveness of healing activity of hydroalcoholic extracts of fruits of *Luffa cylindrica* Linn by using aspirin plus pylorus ligated model.

Materials and Methods:

Plant collection: The fruits of *Luffa cylindrica* were collected from the surroundings of Hyderabad, Telangana.

Extract Preparation:

The fruits were shade dried and made into a coarse powder which was passed through a 40-mesh sieve to get a uniform particle size and then used for extraction. A weighed quantity (500 g) of the powder was then subjected to continuous hot extraction in Soxhlet apparatus with hydroalcoholic solvent (ethanol 50% + water 50%) and the residual marc was collected. The solvent was eliminated under reduced pressure. The dried material yielded 37.0 g (7.5%) of the crude hydroalcoholic extract of fruits *Luffa cylindrica* (HAE).

Phytochemical Screening:

The preliminary phytochemical investigation for fruit extracts of *Luffa cylindrica* was carried out in order to detect various phytoconstituents as per standard methods. (Kokate et al., 2007)

Animals used:

Albino wistar rats of either sex weighing between 150 to 200 gm are used for the following activities. The animals were housed under standard conditions of temperature ($25\pm 2^{\circ}\text{C}$) and relative humidity (30-70%) with a 12:12 light-dark cycle. The animals were fed with standard pellet diet (NIN, Hyderabad) and water ad libitum.

METHOD:

Aspirin was suspended in 1% CMC solution and administered orally in the dose of 200 mg/kg in non-fasted rats once daily for 5 days. HAE and Omeprazole were administered orally to the respective treatment groups 30 min before each aspirin treatment where as the control group received only vehicle (1% CMC solution). On the 6th day, pylorus ligation (Shay Millar et al., 1945) was performed under ether anaesthesia on 36 h fasted rats, immediately after pylorus ligation aspirin treatment was given. Drinking water was withheld after pylorus ligation on 6th day in each rat and gastric juice (Parmar et al., 1984) was allowed to accumulate for a period of 4 h.

The rats were then killed by an overdose of anaesthetic ether and stomachs were cut along greater curvature. The gastric contents were then collected through the oesophagus and measured for volume. They were centrifuged at 3000 rpm for 20 min. The supernatant was subjected to analysis for titrable acidity and total volume of gastric juice. The stomachs were opened along the greater curvature, and the mucosa was rinsed with cold normal saline to remove blood contaminant, if any the sum of the length (mm) of all lesions for each stomach was used as the ulcer index (UI). In each rat, the macroscopic injury of each ulcer was scored by an independent observer according to a scale ranging from 0 to 4 as follows: (0) no macroscopic changes, (1) mucosal erythema only, (2) mild mucosal oedema, slight bleeding or small erosions, (3) moderate oedema, bleeding ulcers or erosions, and (4) severe ulceration, erosions, edema and tissue necrosis (Millar et al., 1996).

EXPERIMENTAL DESIGN:

Antiulcer activity was carried out by using Aspirin plus Pylorus ligation (Shay) method induced gastric ulcer. In this study animals were divided into 4 groups, each comprised 6 rats.

- Group I : Control (Normal saline 1ml/kg (0.3% w/v CMC))
- Group II : Standard drug (Omeprazole 2mg/kg)
- Group III : Hydroalcoholic Extract of fruit of *Luffa cylindrica* (100mg/kg body weight)
- Group IV : Hydroalcoholic Extract of fruit of *Luffa cylindrica* (200mg/kg body weight)

Results and Discussion:

PHYTOCHEMICAL EVALUTION	INFERENCE
Alkaloids	+
Carbohydrates	-
Glycosides	-
Saponins	+
Tanins	+
Flavonoids	+

‘+’ indicates: Present,

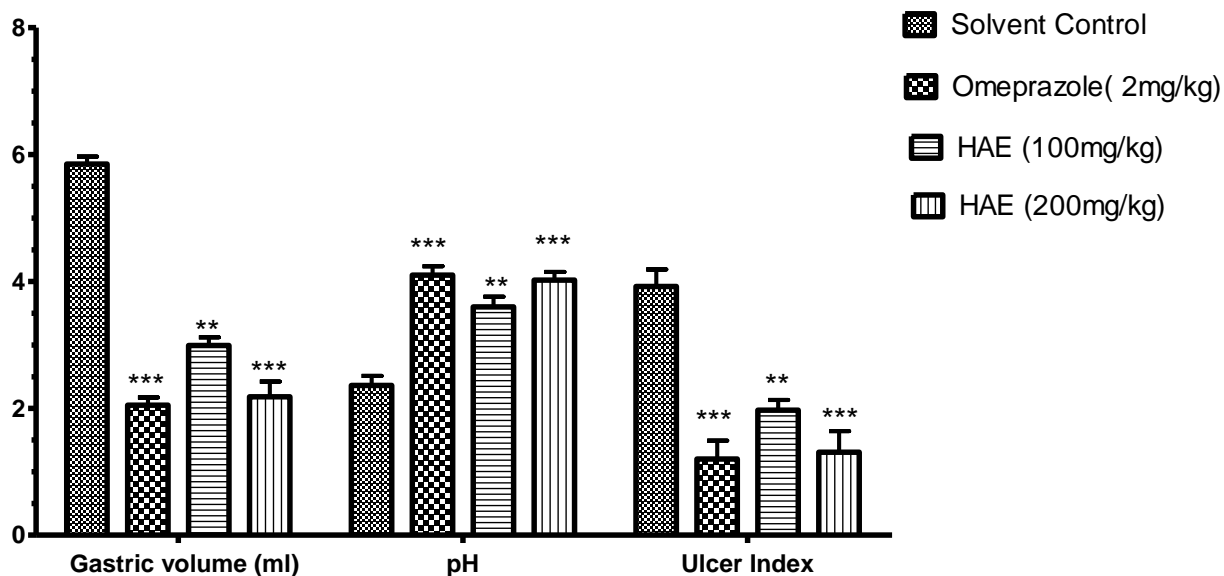
‘—’Indicates: Absent

Table No: 1 Effect of hydroalcoholic extract of fruits of *luffa cylindrica* Aspirin Plus Pylorus Ligated (Shay) Rat Model

S.No	Treatment and Dose	Gastric volume (ml)	Gastric pH	Ulcer Index
1.	Solvent Control (1ml/kg)	5.85 ± 0.12	2.36 ± 0.15	3.92 ± 0.27
2.	Omeprazole (2mg/kg)	2.05±0.12***	4.10 ±0.14***	1.20± 0.29***
3.	HAE (100mg/kg)	2.99±0.13**	3.60 ±0.16**	1.97± 0.16*
4.	HAE (200mg/kg)	2.18 ±0.24***	4.02±0.13***	1.31± 0.33***

Values are expressed in Mean±SEM (n=6). All the test results were compared with control group and * significant indicate p<0.05, the results were statistically analysed by ANOVA followed by Dunnett’s test.

Fig no:1 Effect of hydroalcoholic extract of fruits of *luffa cylindrica* Aspirin Plus Pylorus Ligated (Shay) Rat Model



The antiulcer activity of HAE fruit of *luffa cylindrica* was studied at two dose level (100 and 200mg/kg) in Aspirin plus Pylorus Ligated (Shay) Rat Model. The results showed a significantly ($p < 0.01$ and $p < 0.001$) decreased in gastric volume, ulcer index and increased in gastric pH. The results were observed at the dose of 200 mg/kg, it was exhibited equipotent to Omeprazole in decreasing in gastric volume, ulcer index and increasing in gastric pH.

DISCUSSION:

Aspirin plus pylorus ligation-induced gastric ulcer model is a useful model to induce severe ulceration in experimental animals. (Sanmugapriya et al., 2007), Aspirin causes mucosal damage by interfering with prostaglandin synthesis, increasing acid secretion and back diffusion of H^+ ions. (Rao et al., 2000) The inhibition of mucosal prostaglandin production occurs rapidly following oral administration of aspirin. This is correlated with the rapid absorption of these drugs through the mucosa. (Parmar et al., 1993) In pylorus ligation, the digestive effect of accumulated gastric juice and interference of gastric blood circulation are responsible for the induction of ulceration (Patel et al., 2000).

In the present study, the HAE of fruit of *luffa cylindrica* showed the secreted parameters like gastric volume and, free and total acidity were decreased indicates that of the HAE may have as anti secretory effect and decreased ulcer index which is reliable index of ulceration indicating. The HAE may act by inhibiting gastric acid secretion and also enhances gastric mucosal content against aspirin induced mucosal damaged finally it was observed from the results, it was exhibited as gastric protective activity due to presence of alkaloids and flavonoids in the extract.

Conclusion:

It can be concluded that this hydroalcoholic extract (HAE) of fruits of *luffa cylindrica* has anti-secretory as well as gastro-protective activity, this type of activity mainly due to presence of various ingredients especially alkaloids, tannin, saponins and flavonoids.

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