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Research Article

Antiulcer Activity Of Ficus Carica On Ethanol And Aspirin Induced Gastric Ulcer In Wistar Albino Rats

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ABSTRACT

To evaluate that gastric ulcer protecting properties on methanolic extract leaves of *Ficus carica* (*F. carica*) in various trial model of gastric sore in rats. The methanolic extract leaf of *Ficus carica* was studied in a dual dose levels (first 250 mg/kg and second 500 mg/kg, in oral administration) in animals ethanol induced gastric ulcer (5 ml/kg, oral) and aspirin induced gastric ulcer (200 mg/kg) model. The antiulcer properties was checked by compared with ulcer index in experimental drug group with the vehicle control and standards drug. Ranitidine drug (50 mg/kg) was applied standard agent. The parameters in use to evaluated that antiulcer action were Mean ulcer, Gastric pH, gastric juice volume (in ml), and percentage protection, total acidity, free acidity, was measured. The

Administration *Ficus carica* leaves extract toward rats significantly decreases ulcer index value while matched by negative control and treated group. Standard drug of Ranitidine (50 mg/kg body weight, oral) similarly created a significantly reduction the ulcer index value associated by negative control treated group. The results were that leaf of *Ficus carica* possess significantly gastric ulcer protective action.

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INTRODUCTION:

Peptic ulcers are a typical condition that influences 4,000,000 people worldwide consistently. The pathophysiology of peptic ulcer sickness is described by an awkwardness between forceful (H. pylori, Pepsin, and corrosive) and guarded (Prostaglandins, Mucin, Nitric oxide, Bicarbonate, and Growth factors) components. Peptic ulcer sickness (PUS) is quite possibly the most regular gastrointestinal disease connected with huge medical care costs. As indicated by a new report, the yearly worldwide frequency paces of Peptic ulcer sickness range somewhere in the range of 0.1 and 0.2 percent in view of doctor finding and 0.03 to 0.17 percent in light of hospitalization information. There are a few gamble reasons for Peptic ulcer sickness, including utilization of NSAIDs, liquor consumption, smoking, H.pylori infection, and actual pressure. The various symptoms of current pharmacological drugs (gynaecomastia, barrenness, and haematopoietic adjustments), native cures with negligible outcomes can more readily fix peptic ulcers without unfavorable impacts. It was found clinical preliminaries on the effect of natural

salt created from 'Acalypha fruticosa' on stomach ulcers. HSAF demonstrated productive in treating human peptic ulcers without causing adverse consequences. Peptic ulcer treatment in current medication for the most part comprises of Histamine 2 receptor antagonists, PPIs, and ulcer protective agents like sucralfate. Free revolutionaries delivered from oxygen have been connected to the etiology of a wide scope of clinical ailments and gastrointestinal injury ^[1].

Type of Peptic ulcer:-

Peptic ulcer is a condition on GIT that affects the liner of the abdominal and small intestine.

There are two forms of peptic ulcers.

- Duodenal ulcer
- Gastric ulcer^[2].

Gastric ulcer:-

Gastric ulcer occur in the stomach these are called gastric ulcer.

Duodenal ulcer:-

Duodenal ulcer occur in the duodenum these are called duodenal ulcer .

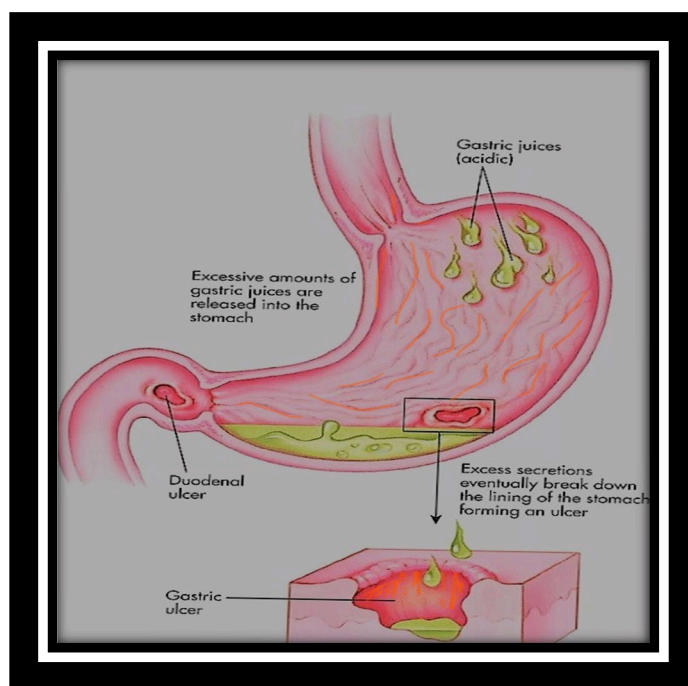


Fig 1: Peptic Ulcer

Type of the peptic ulcer based on site:-

1. Type I:- This is a kind of gastric ulcer with an ordinary bend of the stomach.
2. Type II:- These ulcers have ordinary or upgraded stomach corrosive result.
3. Type III:- Pre-pyloric ulcers are those that show up on the pre-pyloric region of the stomach and have ordinary or upgraded gastric corrosive result.

4. Type IV: These ulcers are situated in the gastroesophageal region, and corrosive emission is ordinary.

Causes of peptic ulcer:-

Helicobacter Pylori, NSAIDs, Alcohol Consumption, Gastric acid secretions, Oxidative stress etc.^[3]

DEFENSIVE FACTORS	AGGRESSIVE FACTORS
Secretion of PG, Mucin, Bicarbonate	Increased secretion of HCl and Pepsin
Adequate blood flow	Reactive oxygen species
Cellular regeneration	Free oxygen radicals
Mucus bicarbonate layer	Inadequate dietary habits
Mucosal barrier	Consumption of NSAID's,
Secretion of NO	Stress, anxiety
Surface mucus secretion	Alcohol

Table 1: List of Defensive and Aggressive factors: ^[4]

SIGNS AND SYMPTOMS OF THE PEPTIC ULCER:-

1. Nausea and Vomiting.
2. Abdomen discomfort.
3. Black stools.
4. Abdominal pain.
5. Hematemesis, dry tongue.
6. Shortness of breathing.
7. Loss of appetite.
8. Chest pain.
9. Fatigue.
10. Weight loss.

MATERIAL AND METHODS**Collection of plant materials:-**

Plant was picked for proposal view of its customary, phytochemical profile was assembled from R.K. Pharmacy College in Kashipur, Surai, Sathion, Azamgarh, Uttar Pradesh in September month, 2021.

Authentication of plant:-

Prof. Nawal Kishor Dubey, Department of Botany, Banaras Hindu University Varanasi, India, approved the plant. For future reference, a voucher example no. Mora. 2021/4 was set at the herbarium of BHU Varanasi.

Requirements:-

1. Chemicals	2. Drugs	3. Solvents	4. Instruments
5. 0.01N NaOH	6. Aspirin	7. Methanol	8. Digital pH meter
9. Alcohol	10. Ranitidine	11. Chloroform	12. Column Chromatography
13. Topfers reagents		14. Ethanol	
15. Normal saline		16. Water	17. Soxhlet extractor
18. Phenolphthalein indicator		19.	
20. Silica gel H			

*Table 2: Scissor Requirements.***Preparation of extracts:-**

Powdered (300g) leaves of the plant was defatted with methanol (60-80° C), and then completely extracted with methanol using soxhlet apparatus at 60°C for eight hour. Extract was sifted on whatman No. 1 filter paper. Solvent was completely removed under reduced pressure in a rotator vacuum evaporator to get a powdery mass. The concentrated extract (yield solid mass 12.05% w/w) was stored in vacuum desiccators for further use^[5].

Experimental Animals:-

For this experiments male utilize wistar albino rats balancing 150-200 gms. In polypropylene cages (38 x 23 x 10 cm) with paddy husk as bedding was arrangement for all rats treatment groups. Organization Temperature of 25±2°C, comparative humidity of 50±5 percent rats housed. Monitored light (12 h dim / 12 h sunny period). Fresh water ad libitum, fed using normal pellet nutrition allowed to all animals. The experiments was performed following animals ethics guidelines of “Institutional Animals Ethics Committee” (Approval No:1384/PO/Re/S/10/CPCSEA).

SN.	Groups	No. of Animals
1	Normal Control (only water)	6
2	Negative Control	6
3	Standard (Ranitidine) 50 mg/kg	6
4	MEFC 250 mg/kg	6
5	MEFC 500 mg/kg	6

*Table.3***Ethanol induced peptic ulcer:-**

Mainly wistar albino rats are weigh up 150-200 g deprived of food 24 hour previous to the experimentation but permitted only water. Allocated into five groups of all animal. Every groups consist of 6 animals. Coprophagia was prevent by using specially constructed cages. After one hour given absolute ethanol, anaesthetized all animals by using

chloroform anaesthesia and stomach was cut along with greater curvature.

Group I- Normal control (only water administered)

Group II- Negative control (Fasting 24 hours received absolute ethanol 5ml/kg of body weight orally) on final experiment day.

Group III- Standard (Ranitidine 50 mg per kg body weight, oral) used with delivered absolute ethanol (5ml/kg body weight orally) on final experiment day.

Group IV-Test 1(FCME 250mg/kg body weight oral) used with received absolute ethanol (5ml/kg body weight orally) on final experiment day.

Group V-Test 2 (FCME 500mg/kg body weight orally) for 7 days with received absolute ethanol (5ml/kg of body weight orally) on 7th day.

Everything drugs were managed of period of 7 days.

Aspirin induced peptic ulcer:-

Manly wistar albino rats are balancing 150-200 g are deprived of food 24 hour previous to the experimentation but permitted only water. Allocated into five groups of all animal. Every groups consist of 6 animals. Coprophagia was prevent by using specially constructed cages. After four hour given the aspirin, anaesthetized all animals by using chloroform anaesthesia and stomach was cut along with greater curvature.

Group I- Normal control (only water administered)

Group II- Negative control (Fasting 24 hours received aspirin 200mg/kg of body weight orally)on day of trial on 10th day.

Group III- Standard (Ranitidine 50 mg per kg body weight orally.) for 10 day and 10th day delivered Aspirin (200mg per kg body weight orally).

Group IV-Test 1(FCME 250mg per kg body weight orally) for 10 day with received Aspirin (200mg/kg body weight orally on 10th day).

Group V-Test 2 (FCME 500mg/kg body weight orally) for 10 day with received Aspirin (200mg/kg body weight orally) on 10th day.

Everything drugs were managed for period of 10 days.

Measurement of various parameters:-

Estimation of gastric pH:-

To decide the gastric volume and pH, the gastric liquid gathered from the stomach of a mouse would be moved into a rotator chamber. The chambers will be centrifuged for 10 minutes at 1000 cycles each

moment, and the gastric volume will be controlled by the promotion on the chambers. The supernatant will be gathered, and the pH will be checked utilizing a computerized pH meter^[6].

Estimation of total acidity:-

Stomach liquid 1 ml was dilute using distilled water (9 milliliter), add two-three drops of phenolphthalein indicator, titrated by 0.01 N sodium hydroxide till a consistent pink tone was accomplished. The measure of sodium hydroxide (0.01N) consumed. The total acidity was calculated by milliequivalents per litre (mEq/L) following formula^[7].

$$\text{Acidity} = \frac{\text{Vol. of NaOH} \times N \times 100 \text{ mEq/L}}{0.1}$$

Where, N= Normality of NaOH solution

Estimation of free acidity:-

Free destructiveness was resolved utilizing Topfer's reagent. Also separable measures of gastric juice were titrated by 0.01N sodium hydroxide observed permanent pink color. It was measured 0.01 N sodium hydroxide is consumed. Free acidity was designed by milliequivalents per liter (mEq/L) following formula^[8].

$$\text{Acidity} = \frac{\text{Vol. of NaOH} \times N \times 100 \text{ mEq/L}}{0.1}$$

Statistical analysis:-

Data existed expressed as mean \pm SEM. Data of antiulcer action of methanolic remove leaves of ficus carica were calculated by one way ANOVA followed by Brown-Forsythe test $P < 0.05$, $P < 0.0001$) was considered as statistically significant . The significance of difference was accepted at $P < 0.05$.

RESULT AND DISCUSSION:-

Phytochemical Screening:-

F. carica primary subjective investigation demonstrated the presence of alkaloids, flavonoids, Coumarin, proteins and amino acids, and triterpenoids.

Table. 4: Preliminary phytochemical screening of ficus carica leaves

Constituents	Methanolic Extract
Alkaloids	+
Flavonoids	+
Coumarin	+
Proteins and amino acids	+
Triterpenoids	+
Saponins	—

Ethanol-induced ulcer:

Ethanol-initiated ulcer model, there was significant injury to gastric mucosal layer in the charge group, and the MEFC-treated group exhibited practically tremendous anticipation on stomach mucosa matched

to conventional Ranitidine-treated gathering. Mean ulcer file of the MEFC-treated group was 0.93 ± 0.002 , indicating superior results matched to negative control gathering, which had mean ulcer file on 2.30 ± 0.01 .

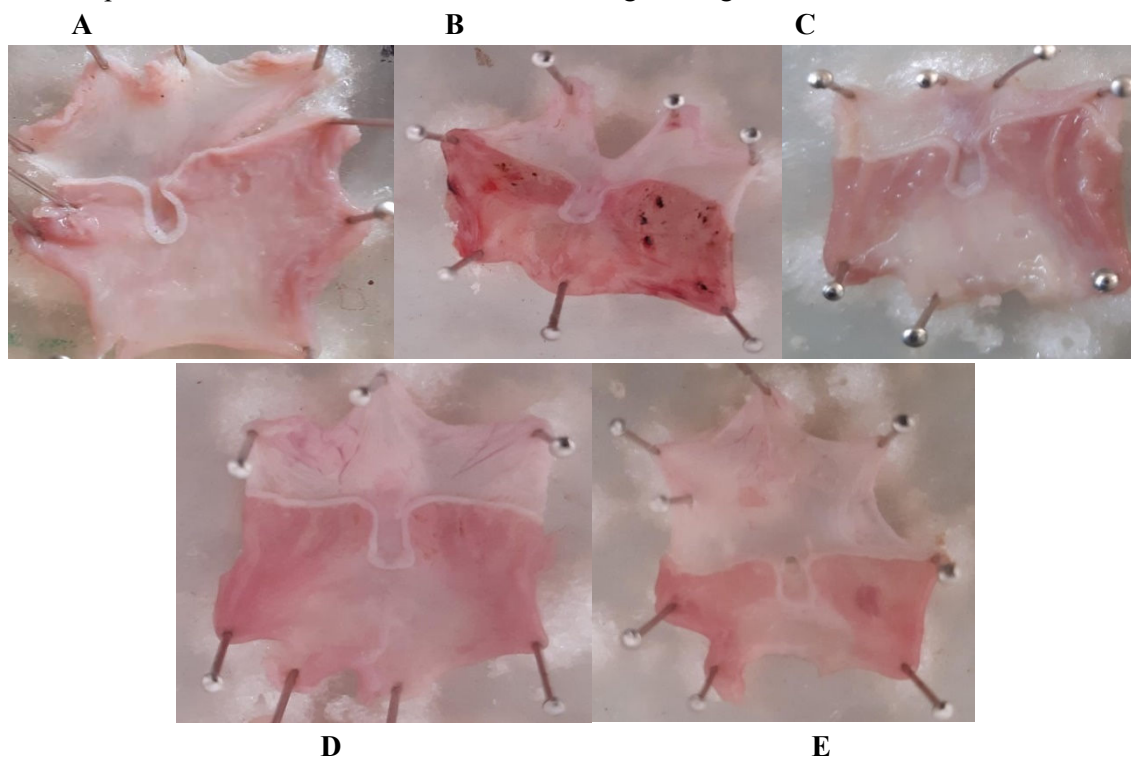


Figure 2 : Anti-ulcer action methanolic extract found since *F.carica* leaf.

A: Stomach of rat normal control.

B: The stomach of a rat negative control gathering has a greater ulcer region.

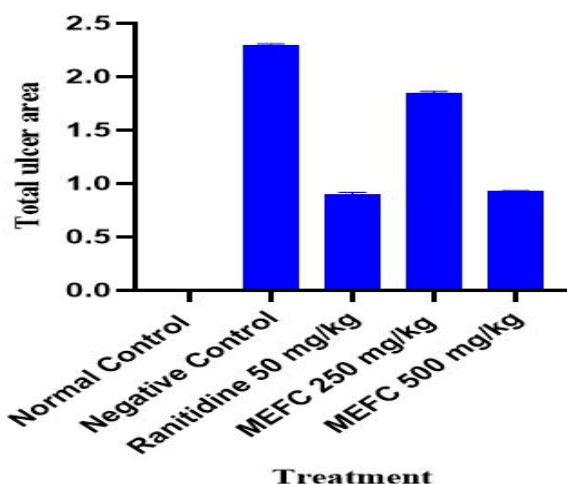
C: A rat's stomach after being given ranitidine.

D: Stomach of the rats given 250 mg/kg extract.

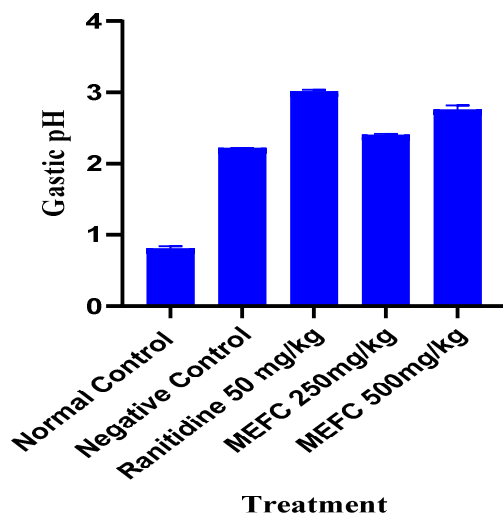
E: Stomach of the rats given 500mg/kg extract.

Table. 4 : Effect of MEFC on ethanol induced ulcer model

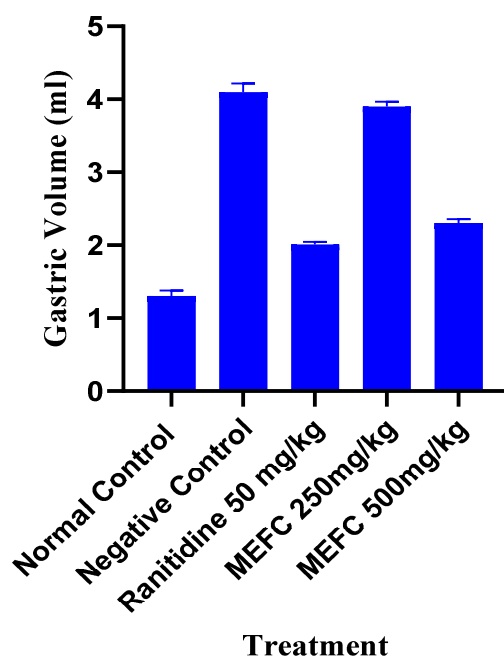
SN.	Groups	Dose (Mg/kg)	Mean ulcer index \pm SEM	Protection (%)	Gastric pH	Gastric volume (ml)	Free acidity (mEq/L)	Total acidity (mEq/L)
1.	Normal Control				0.8 \pm 0.04	1.3 \pm 0.08	30.31 \pm 1.26	58.14 \pm 1.07
2.	Negative Control	-	2.30 \pm 0.01	-	2.21 \pm 0.01	4.10 \pm 0.12	70.50 \pm 2.29	110.12 \pm 3.23
3.	Standard (Ranitidine)	50	0.90 \pm 0.018	87.05	3.01 \pm 0.03	2.01 \pm 0.04	31.34 \pm 1.29	60.14 \pm 4.26
4.	MEFC	250	1.85 \pm 0.013	30.03	2.40 \pm 0.02	3.90 \pm 0.07	51.37 \pm 1.36	90.16 \pm 4.16
5.	MEFC	500	0.93 \pm 0.002	69.10	2.75 \pm 0.07	2.30 \pm 0.06	38.12 \pm 1.28	67.18 \pm 3.78



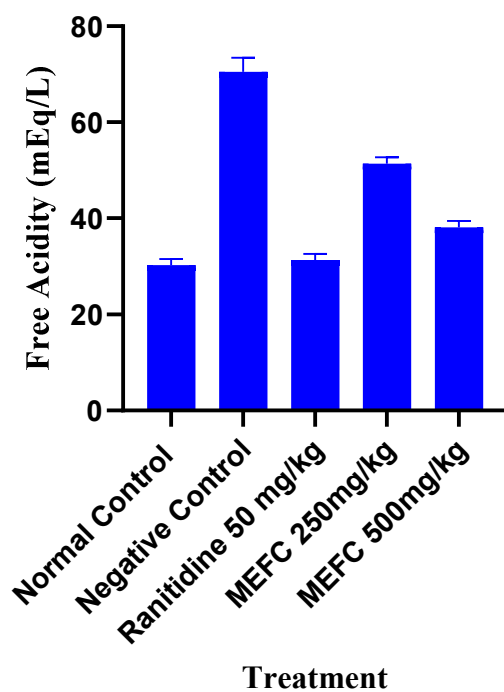
Graph 1: Ulcer index of the different group. Value expressed as (Mean \pm SEM) (n=6), significant at $p < 0.05$ as matched through control.



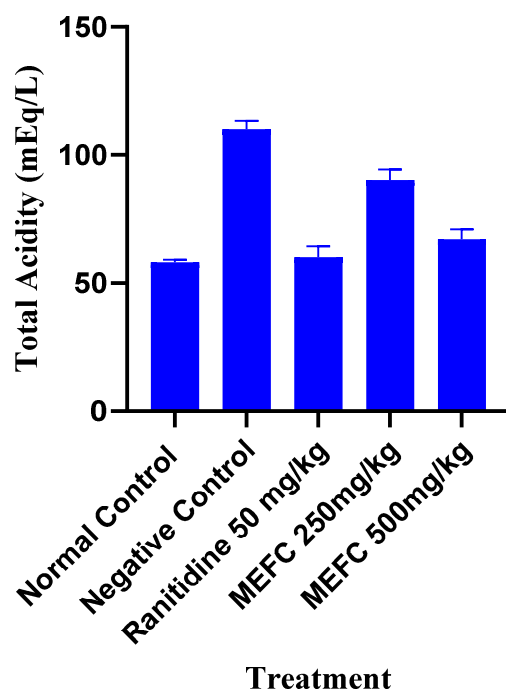
Graph 2: Average of gastric juice of gastric pH.



Graph 3: Average of gastric juice of gastric volume.



Graph 4: Average of gastric juice of free acidity.

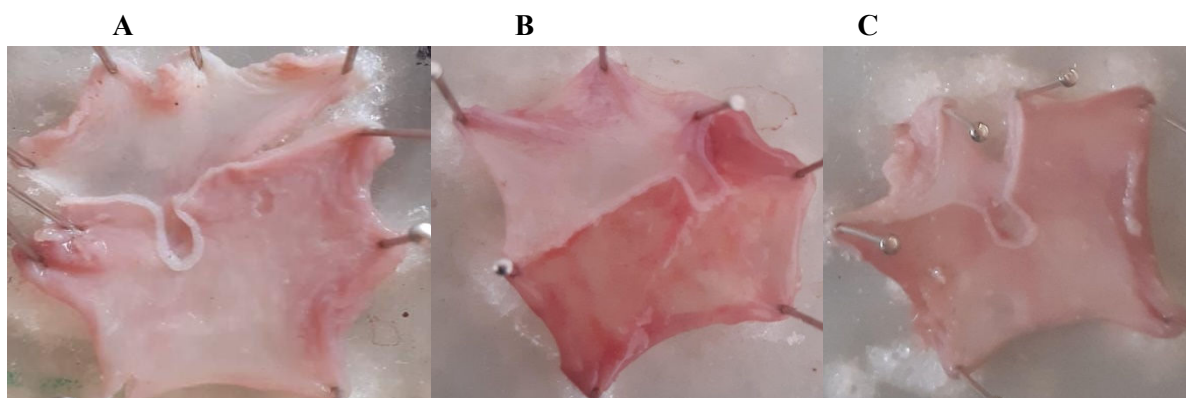


Graph 5: Average of gastric juice of total acidity.

Aspirin induced ulcer model:-

It is clear that ulcer file of MEFC-treated gathering was not exactly the benchmark group in chilly pressure restriction ulcer model. From a naturally visible photo MEFC on portion of 500 mg per kg

displayed better gastric mucosal protecting. Ulcer list of MEFR was 1.02 ± 0.03 , while of standard Ranitidine was 0.85 ± 0.12 which was superior to negative control group 2.14 ± 0.01 .



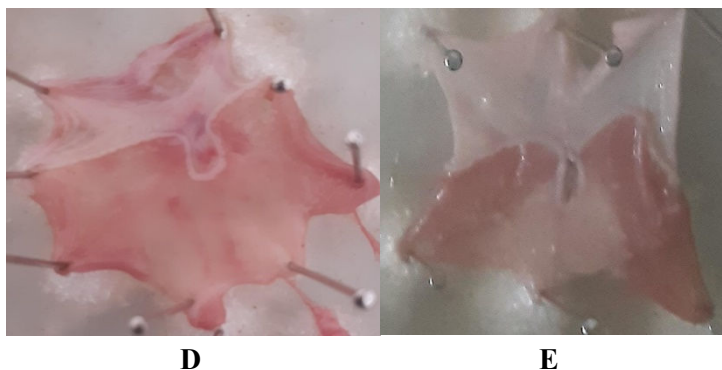


Figure 3: Anti-ulcer action methanolic extract found since *F.carica* leaf:-

A: Stomach of rat normal control.

B: Stomach of a rat negative control group showing larger ulcer area.

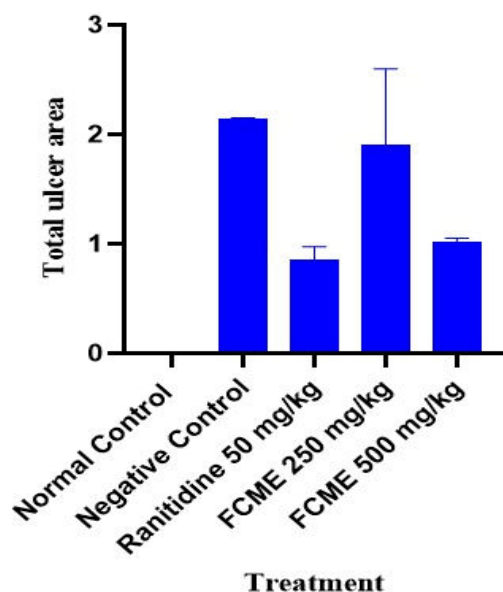
C: Stomach of a rat treated with standard (ranitidine) drug 50 mg/kg.

D: Stomach of rat treated with extract 250 mg/kg.

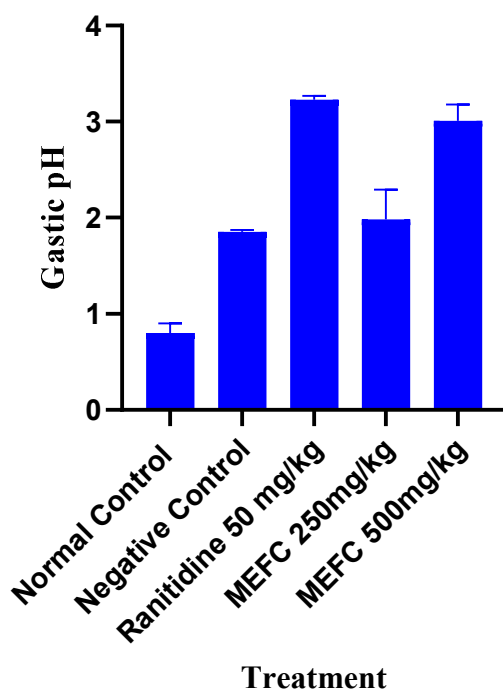
E: Stomach of rats treated with extract 500 mg/kg.

SN.	Groups	Dose (Mg/kg)	Mean ulcer index \pm SEM	Protection (%)	Gastric pH	Gastric volume (ml)	Free acidity (mEq/L)	Total acidity (mEq/L)
1.	Normal Control				0.80 \pm 0.10	1.3 \pm 0.08	29.40 \pm 1.7	50.12 \pm 3.14
2.	Negative Control	200	2.14 \pm 0.01	-	1.85 \pm 0.02	4.20 \pm 0.12	71.60 \pm 2.60	113.12 \pm 4.12
3.	Standard (Ranitidine)	50	0.85 \pm 0.12	87.01	3.23 \pm 0.04	2.20 \pm 0.06	30.39 \pm 2.70	62.17 \pm 1.92
4.	MEFC	250	1.90 \pm 0.70	29.02	1.98 \pm 0.31	3.95 \pm 0.03	50.60 \pm 2.36	96.11 \pm 1.02
5.	MEFC	500	1.02 \pm 0.03	70.13	3.01 \pm 17	2.35 \pm 0.01	39.18 \pm 1.30	70.36 \pm 3.38

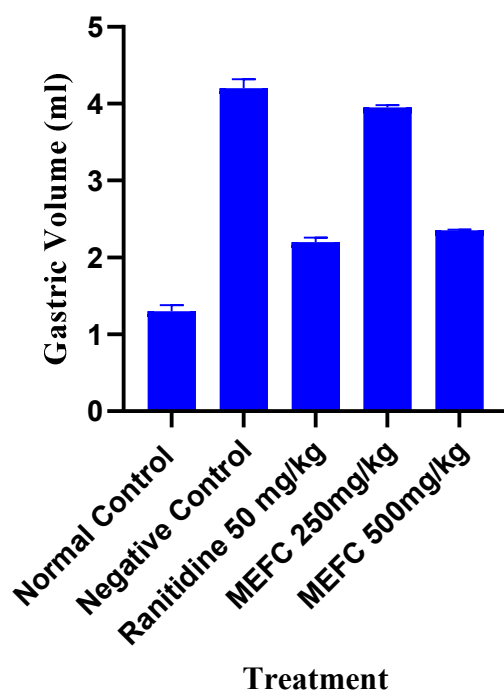
Table. 5 : Effect of MEFC on aspirin induced ulcer model



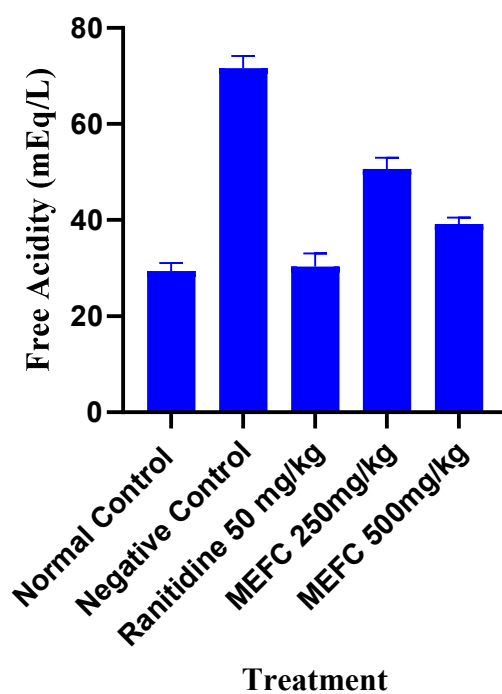
Graph 6: Ulcer index of the different group. Value expressed as (Mean±SEM) (n=6), significant at $p < 0.05$ as matched through control.



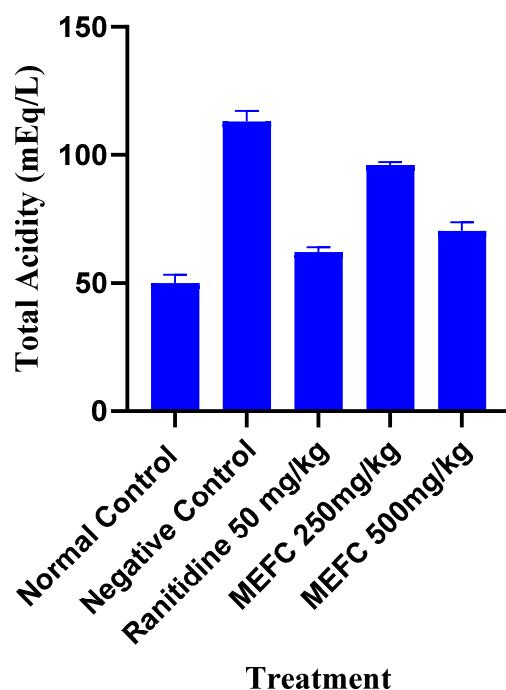
Graph 7: Average of the gastric juice of gastric pH.



Graph 8: Average of gastric juice of gastric volume.



Graph 9: Average of the gastric juice of free acidity



Graph 10: Average of gastric juice of total acidity

The *ficus carica* is a very popular plant these are belong to the family of moraceae, This plant contains various types of phytochemical such as, glycoside, alkaloids, flavonoids, tannins, protein and amino acids etc. These plant have been responsible for various types of properties such as, antioxidant, antidiabetic, hepatoprotective, antiangiogenic, immunomodulatory, anticancer, antipyretic, analgesic and anti-inflammatory, antiviral and phytotoxic. The current study discussion that *Ficus carica* (*f.carica*) exhibits both gastro protective and sore curing activity. Methanolic remove *Ficus carica* reduction the gastric ulcer index therefore performance of anti ulcerogenic properties by ethanol and aspirin prompted gastric ulcer models. Oral management MEFC 500 mg per kg body weight to animals followed by Brown-Forsythe test $P < 0.05$, $P < 0.0001$) was considered as statistically significant.

Though there numerous drugs are presented in markets of gastrointestinal sores protective, containing PPIs, H₂ antagonist, antacids, anticholinergic is applicable, that agents create various adversarial responses such as severe interstitial

nephritis, hepatotoxicity, anaphylaxis reaction,

hematopoitic change, thrombocytopenia and nephrotoxicity.

Current study medicinal plant with very less adverse effects good replacements cure of stomach ulcers. Orally management on absolute ethanol (99.89%) in animal lead toward higher by rapid induced damaged of mucosal capillaries. The plant extract of *Ficus carica* produced work against the gastric damage. Result of the present study showed that *Ficus carica* leaves of methanolic extract possesses anti-ulcer activity.

CONCLUSION

The *Ficus carica* plant was harvested, dried in the shade, and processed with methanol. Column chromatography was used to separate the phytochemical constituent fractions from a methanol extract of *Ficus carica*. Chemical testing and UV analysis were used to investigate the phytochemical ingredients present in fractions. The current study's findings indicated that *ficus carica* leaf extract had substantial antiulcer activity. The presence of numerous types of phytochemicals, including as phenols, flavonoids, alkaloids, coumarin, and so on, add significantly to its medicinal properties, which may be one of the reasons for its use in cure of wide types of illnesses. The methanolic extract leaves of *Ficus carica* was studied in a two dose levels (first 250

mg per kg and second 500 mg per kg, in oral administration) in animals ethanol induced gastric ulcer (5 ml/kg, oral) and aspirin induced gastric ulcer (200 mg/kg oral) model. The antiulcer properties was checked by compared with ulcer index in experimental drug with the vehicle control and standards drug. Ranitidine drug (50 mg per kg) was applied as a standard agent. The Administration on *Ficus carica* leaves extract toward animals significantly decreases ulcer index rate when matched by negative control and treated group. Standard drug of Ranitidine (50 mg per kg, oral) similarly created a significantly reduction of ulcer index value matched by negative control, treated group. Results were that the leaves of the *Ficus carica* possessed significantly anti-ulcer activity.

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