To Evaluation of Phytochemical, Pharmacognosticalal and Anti-ulcer activity of leaves *Murraya Paniculata*

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Abstract:

Introduction:

Ulcers can grow on the inner lining of the stomach (gastric ulcer) or the small intestine (duodenal ulcer). Peptic ulcers are another term for both types of ulcers. It affects nearly 10% of the global population.

Aim:

To evaluation of Phytochemical, Pharmacological and anti-ulcer study of Murraya paniculata leaves on wistar rats.

Materials and Methods

This study used ethanol-caused ulcer and swimming stress-induced ulcer models in Wistar rats. An ethanolic extract's antiulcer activity (150, 200, and 400mg/kg p.o. for 7 days) was compared to that of a reference drug (Rabeprazole). Gastric volume, pH, total acidity, free acidity, and ulcer index were the parameters studied in the Ethanol induce ulcer and Swimming stress-induced ulcer models, whereas ulcer severity is assessed in the ethanol induce ulcer and Swimming stress-induced ulcer models. The criteria studied were ulcer index, gastric juice volume, pH, free acidity, and total acidity.

Results

When ethanolic extract treatment groups were associated with ulcer-control groups, the volume of ulcer index, stomach volume, pH of gastric juice, and total and free acidity activity was significantly reduced at $p<0.05$ and $p<0.01$, respectively. When compared to the ulcer control group, all dosages of M. paniculata L displayed dose-dependent antiulcer efficacy as well as a significant ($p<0.05$ and $p<0.01$) reduction in the ulcer index in all experimental models.

Conclusion

The outcomes of the study indicate that the ethanolic extract of M. paniculata has more anti-ulcer power, providing validity to folkloric medicine's conventional claims.

Keywords: Pharmacognosic effect, phytochemical evaluation, antiulcer action, Cysteamine, Ulcer index, stomach volume, pH of gastric juice, total acidity free acidity, and Murrraya paniculata L, among other things.

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INTRODUCTION:

Medicinal plants:

A plant with medicinal properties is any plant that contains compounds in one or more of its organs that can be used for therapeutic purposes or that are precursors for the production of lucrative pharmaceuticals. This description distinguishes between medical plants whose therapeutic qualities and constituents have been scientifically validated and medicinal plants that have been identified as medicinal but have not yet been subjected to a thorough scientific analysis. (Sofowora A 2008)

Ulcer

An excruciating lesion also known as ulcer suggests it to be an open damage. Existence of injuries inside the lining of stomach with upper part also affected which is connected to tract. Anulcer which exists in the stomach is known to be gastric ulcer whereas the other known as duodenal ulcer which lies in the underlying section with in small digestive tract. It develops when a large veneer of natural material is reduced or diminished which eventually fortify the abdomen from juices of gastric system. Empowering the stomach corrosive to crack or decimate the layer of protection that governs the stomach and leads to ulcer.

PLANT PROFILE

Murraya paniculata is a species of shrub or small shrub endemic to Australia, South Asia, and Southeast Asia in the Rutaceae family. Other common names include orange jasmine, orange Jessamine, china box, and fake orange (F.A.Zich 2021). The smooth bark, as many as 7 egg-like to oval leaflets per leaves, fragrant white or cream blooms, and oval in shape, red to orange berries with hairy seeds characterize this plant. Its leaves are also pinnate.

Material and methods:

The plant was collected in botanical garden Meerut, from March to July. The plant's fresh leaves were cleaned of contaminants, dried in the shade, broken up into tiny bits, and roughly ground.

Pharmacognostical study:

Ash Value:

Principle:

It is customary to believe that the leftovers from incineration are the ash portion of a crude drug. It normally shows the inorganic salts that cling to the medication naturally, but it could also contain inorganic waste that was added with deliberate adulteration. There is a sizable variance that fluctuates within restricted ranges for the same specific medication. A basis for assessing the

A medication's identification and purity is thus provided by an ash determination, which also offers information about any inorganic matter that may have been introduced to adulterate it. A few of well-known medications have specified ash criteria. As a result, the maximum allowable total amount of ash or acids insoluble ash is typically mentioned.

To calculate various ash values, including total ash and acid insoluble ash, Indian pharmacopoeia procedures were employed.

Total Ash:

In a tarred silica crucible, a precisely weighed 3 grams of air dried powdered medication was heated until it was dull red and carbon-free. The percentage of total ash was then calculated using the air dried medication as a reference, after it had cooled and been weighed.

Acid insoluble Ash:

The ash was heated for 5 minutes with 25 ml of 2N hydrogen chloride before the dissolved material was collected on ash less screen paper, rinsed by hot-water, ignited, and evaluated, as described as "total ash" supra. The air dried drug was then utilized as a guide to determine the acid insoluble ash proportion.

Water soluble Ash:

The entire amount of ash was boiled for five minutes in 25 cc of water. The insoluble material was collected using the ash less filter paper, and after being rinsed with hot water, burned for 15 minutes at a temperature of no higher than 450°C. The weight of the insoluble substance was subtracted from the weight of the total ash. The weight disparity represents the water-soluble ash. The drug that was air dried is utilized to determine the percentage of water soluble ash.

Value extracted:

The extractive values of crude medication were valuable intended for evaluating a drug's components when they cannot be easily determined by any other way. These figures also show the kinds of components that go into making a crude medication.

Assessment of alcohol solvable extractive value:

Murraya paniculata Linn coarse powder, 5 gm., was macerated for 24 hours in a closed flask with 100 ml of 90% ethanol, shaking frequently for the first 6 hours and letting stand for the next 18. After that, it was swiftly filtered while taking precautions to stop the solvent from leaking out. In a shallow dish with a flat bottom that had been covered with tar and dried at 105°C, 25 ml of the remains is evaporated to dried ness before being weighed. The percentage of ethanol soluble extractive value was calculated using the air-dried medicine.

Assessment of water soluble extractive value:

5 grams of medicine that has been coarsely powdered should be precisely weighed. It should then be macerated with 100 ml of chloroform water for 24 hours, with frequent shaking during the first 6 hours, before being left to stand for 18 hours. It was then swiftly filtered while safety precautions were taken to prevent solvent loss. The filtrate was next dried for 25 ml at 105°C in a shallow dish with a flat bottom with tar on it. The air dried medicine used as a baseline when calculating the proportion of water soluble extractive.

Loss on dry:

Losses on dryness are the weight loss expressed as a weight-to-weight ratio, and it is calculated using the procedure below. The amount of volatile material, including water that may be evacuated below the conditions (hot-air ovens), is established. If the taster is a large crystal, shred it fast into a powder to make it smaller.

Processor:

About 1.5 grams of powdered medication were weighed on a tarred porcelain plate that had been dried to a constant mass in a hot air oven at 105°C and then measured. The weight difference was utilized to calculate the percentage drying loss against air dried product. The outcomes are shown into the tables.

The foaming index:

The foaming-index is mostly used to calculate the saponin concentration into an aqueous plant extract.

Assessment of foaming index:

1g of the drug's coarsely powdered, powder was accurately measured, and 100ml of boiling water was added to make a 500ml conical flask. Maintained at a manageable level boiling at 80-90°C for around thirty minutes. After being additional by the filter, it was cooled and filled to 100ml (V1) with enough water. Consecutive volumes of 1, 2, and 3 ml up to 10 ml were placed into clean, uniformly sized, 10-stoppered test tubes. The liquid level was then brought to 10 ml in each test tube using water

Phytochemical assessment:

Plant material extraction:

Ethanolic Extract:

400g of dried in the air powdered substance was introduced to a 1000 ml Soxhlet device and extracted for two days by petroleum-ether. The powder was removed and dried at the end of the second day. It's once again packed later drying, and the color is eliminated using ethanol as the solvent until it was completely gone. It was kept at a comfortable 55 to 65^0 C. After that, the extract was concentrated using distillation, and the solvent was collected. Evaporation was used to dry the final solution. The color, constancy, and produce of the ethanolic abstract are noted.

Table2.1: Nature and color of Murraya paniculata L.

Sr. No.	Name of extract	Color	Consistency	Yield %
1.	Ethanolic extract	Brown-color	Sticky-mass	25.98%

Chemical test:

Carbohydrate test:

The extract was filtered after a little quantity of it was mixed in 5ml of purified H_2O. The remains were examined to look for different phytochemical components in the sample.

Molisch's test

2-3 ml of filtrate was dissolve with a few droplets of Molisch's reagent, and the test tube walls were then coated with strong sulfuric acid. A violet colored ring emerges when two liquids come together, indicating the presence of carbohydrates.

Fehling's test

Fehling's solution consists of two parts: Fehling's A and Fehling's B. Fehling's A is a transparent solution of potassium sodium tartrate and sodium hydroxide, whereas Fehling's B is a blue solution of copper (II) sulphate pentahydrate.

To perform the Fehling's test, a small amount of the sample is added to a test tube containing equal volumes of Fehling's A and Fehling's B. The test tube is then heated in a water bath. If the sample contains a reducing sugar or aldehyde, the copper (II) ions will be reduced to copper (I) oxide, which will precipitate out of solution as a red or brick-red precipitate.

Benedict's test

Benedict's reagent is a complex combination of sodium citrate, sodium carbonate, and pentahydrate copper (II) sulphate. When a reducing sugar is added to Benedict's reagent, copper (II) ions are reduced to copper(I) oxide, which precipitates out of solution as a red or brick-red precipitate.

Test for Alkaloids

Little extract combined with a few milliliters of dil. HCL. Filtered and well-shaken. The collected filtrate is applied for the assays that follow.

Dragendorff's test

1. Prepare Dragendorff's reagent by mixing 10 g of potassium bismuth iodide and 10 g of potassium iodide in 100 mL of acetic acid.
2. Add a small amount of the sample to a test tube.
3. Add a few drops of Dragendorff's reagent to the test tube.
4. Observe the test tube for the formation of a precipitate.

If a precipitate forms, it is an indication that the sample contains alkaloids. The color of the precipitate can vary depending on the type of alkaloid present. For example, morphine produces a red precipitate, while quinine produces a yellow precipitate.

The Mayer test

Here are the steps on how to perform the Mayer test:

1. Prepare Mayer's reagent by mixing 1.36 g of mercuric chloride and 5.00 g of potassium iodide in 100 mL of water.
2. Add a small amount of the sample to a test tube.
3. Add a few drops of Mayer's reagent to the test tube.
4. Observe the test tube for the formation of a precipitate.

If a precipitate forms, it is an indication that the sample contains alkaloids. The color of the precipitate can vary depending on the type of alkaloid present. For example, morphine produces a cream-colored precipitate, while quinine produces a yellow precipitate.

The Wagner test

Here are the steps on how to perform the Wagner test:

1. Prepare Wagner's reagent by mixing 1.00 g of bismuth chloride and 1.00 g of potassium iodide in 100 mL of hydrochloric acid.
2. Add a small amount of the sample to a test tube.
3. Add a few drops of Wagner's reagent to the test tube.
4. Observe the test tube for the formation of a precipitate.

If a precipitate forms, it is an indication that the sample contains alkaloids. The color of the precipitate can vary depending on the type of alkaloid present. For example, morphine produces a reddish-brown precipitate, while quinine produces a yellow precipitate.

Steroids and Terpenoids detection test:

50 mg of the abstract were combined with 2 ml of chloroform and 2 ml of strong sulfuric acid, and then everything was thoroughly shaken. then saw how the layers of acid and chloroform were colored. The presence of steroids is indicated by the chloroform layer's appearance as a red color and the acid layer's appearance as a greenish yellow fluorescence..

Liebermann -Burchard Test

A test tube containing 50 mg of the extract was filled with 2 ml of acetic anhydride, 2 ml of chloroform, and warmed to hot before chilling. The examination cylinder was then filled with 1 ml of concentrated sulfuric acid, and the production of colour at the junction was watched for. The presence of steroidal terpenoids is indicated by the development of red, pink, or violet colour at the liquid-liquid interface.

Glycoside test

Legal's test

To 1ml of extract, 1ml of pyridine and 1ml of sodium nitroprusside were dissolved. The presence of glycosides is indicated by a pink to red colour.

Test Keller-Killiani

Two milliliters of the extract were treated with glacial acetic acid, a trace amount of ferric chloride, and two to three drops of strong sulfuric acid. When two liquids converge, a reddish brown colour develops, signalling the occurrence of cardiac-glycosides.

The tannin and phenolic compounds identification

Ferric chloride testing: To 2ml of distilled water, 1ml of the abstract's alcoholic solution was added. A few drops of 10% ferric chloride were then added. Phenols are present when blue or green colour develops.

Test for lead acetate

5ml of an aqueous extract has a few drops of lead acetate dissolve to it. The presence of tannins is indicated by the precipitation of yellow or red colours.

Saponin testing

Testing for Foam:

A test sample of one millilitre is dilute with twenty millilitres of purified water H_2O and mix in a graduated tube for three minutes. The presence of saponins is indicated by 1 cm foam after 10 minutes.

Froth test:

NaHCO3 solution is mixed to a test sample volume of 5ml. The combination should be held for three minutes after vigorous shaking. Saponins are present when a froth formation resembling a honeycomb forms.

Test for Flavonoids

Alkaline reagent test

Here are the steps on how to perform the alkaline reagent test:

1. Prepare alkaline reagent by mixing 10g of sodium hydroxide in 100 ml of H_2O
2. Add a small amount of the sample to a test tube.
3. Add a few drops of alkaline reagent to the test tube.
4. Observe the test tube for the formation of a precipitate.

If a precipitate forms, it is an indication that the sample contains flavonoids. The color of the precipitate can vary depending on the type of flavonoid present. For example, quercetin produces a yellow precipitate, while kaempferol produces a green precipitate.

Magnesium hydrochloride reduction test or the Shinodas test:

Before adding a few drops of strong HCl, a tiny piece of magnesium ribbon was employed to treat the extract's alcoholic solution. The presence of crimson-red, or irregularly green to blue tint, suggests the occurrence of flavonoid.

Protein and Amino Acid Analysis

Screening for biuret

3To a 4% sodium hydroxide solution, a tiny amount of a 1% copper sulphate solution and 3ml of the test solution were added. A violet hue appears when proteins are present.

The ninhydrin test

Three milliliters of the test solution and three drops of a 5% Ninhydrin solution were cooked for ten minutes in a pot of boiling water. A purple or bluish designates the occurrence of free amino acids.

Toxicological Assessment:

Acute oral toxicity:

Research has examined the emission's toxic effects. Guidelines No. 1 from the Organisation for Economic Cooperation and Development (OECD). According to 425, the study was completed. The animals used in this case are mice. All night long, animals were fasted and simply given water. The following day, the discharge was observed in the appropriate groups using a gauge with a body weight sensitivity of 2000 mg/kg, and groups were continuously administered for 24 hours to look for any unfavourable conditions as well as behavioural, neurological, and morphological profiles. 72 h. Animals were used in toxicological studies for 14 days. According to the criteria, a dose is considered dangerous if two or three animals per animal die. After an animal dies, the same dosage is given again to confirm the toxicity. If no indicators of mortality are found, plant extraction is thought to be non-toxic. Starting the toxicity test with 100mg/kg body mass and repeating it with doses of 250, 1000, 2000, and 20mg/kg body weight is an alternative method

Evaluation of stomach juice quantity and pH:

The gastric juice was obtained from rats with ethanol-induced ulcers. The resultant digestive juice was then centrifuged for ten minutes at 3000 revolutions per minute. The volume of the supernatant was determined and reported as ml/100g body mass. The pH of the supernatant is measured using a digital pH metre. (Basic and Clinical Pharmacology, 10th edition, Bertram G. Katzung, 2006).

Assessment free and total-acidity:

Pipette an aliquot of 1.0ml of stomach fluid into a conical flask measuring 250 ml, then add 2/3 droplets of Topfer's substance and titrate with 0.01NNaOH until all traces of the red colour have vanished and the solution has turned yellowish orange. It was noted that the volume of 0.01N NaOH agrees to free-acidity. When a lasting pink colour developed, 2/3 drops of phenolphthalein were added, and the titration process was repeated. The amount of total alkali consumed and the amount of total acidity were noted. Free acidity and overall acidity were both.(P and Palit G.,2001)

Ulcer index:

The mucosa is washed through saline, and the abdominal was held to a frogboard. The gastric ulcer was scored, the length of the lesion measured with a division and scale, and the glandular area was studied under a 10x microscope. The ulcer-index for every rat is determined through addition the data, and the mean standards are established.

% inhibition:

Inhibitor as percentage. The percentage inhibition is estimated with the formula below. (Malairajan and colleagues)

Statistical Analysis

With groups of six animals, wholly morals are provided as the averageS.E.M. The Tukey-Kramer multiple comparison tests were employed for comparison, and one-way ANOVA was performed for analysis. At three levels, the values are statistically significant: ***$p<0.001$, **$p<0.01$, *$p<0.05$. But if $p > 0.05$.

Results and discussion:

The outcomes of this investigation show that an ethanolic extract of Murraya paniculata L has gastro defensive properties against an ethanol produce ulceration model.

Pharmacognosticalal assessment:

1. Ash value:

Table 3.1: Ash-value parameters:

S. no.	Parameters	%w/ w
1	Totalash	11.33%
2	Water solubleash	1.97%
3	Acidinsoluble ash	5.33%
4	Sulphatedash	6.44%

2. Extractive value:

Table: 3.2: Extractive value parameters:

S. No.	Parameters	%W/W
1	Water soluble extractive value	4.2%
2	Alcohol soluble extractive value	5.8%

3. Loss on dry:

Table 3.3: Loss on dry parameters.

S.NO.	Parameter	% w/w
1	Loss ondrying	10.19%

Table 3.5: Foaming index assessment of powder leaves of Murraya paniculata.

S. No.	ethanolic extract quantity(ml)	Elevation of foam(cm)
1	1	2.3
2	2	3.5
3	3	3.10
4	4	4.2
5	5	4.7
6	6	4.9
7	7	5.3
8	8	5.66
9	9	6.1
10	10	5.5

Phytochemical assessment:

Table 3.6: phytochemical assessment of Murraya paniculata L:

S.No.	Phytochemical constituents	Ethanolic extract
1	Alkaloids	+
2	Flavonoids	+
3	Saponins	+
4	Tannins	+
5	Steriods	+
6	Cardiac glycoside	+

7	Protein	+
8	Resins	-
9	Starch	-
10	Triterpenoids	+
11	Carbohydrates	+

Antiulcer assessment:

Ethanol induce ulcer:

Table 3.7: effect of Murraya paniculata L on ulcer-index into ethanol induces gastric ulcer.

S. No.	Groups	Ulcerindex (UI)	% inhibition
1	Normalcontrol	00.00±0.0	-
2	Ulcercontrol	18.10± 4.89**	-
3	Murraya paniculata (200mg/kg p.o)	5.36±2.15*	73.55
4	Murraya paniculata(400mg/kg p.o)	3.58±099**	87.60
5	Rabeprazole (20mg/kg p.o.)	2.25±0.33**	93.44

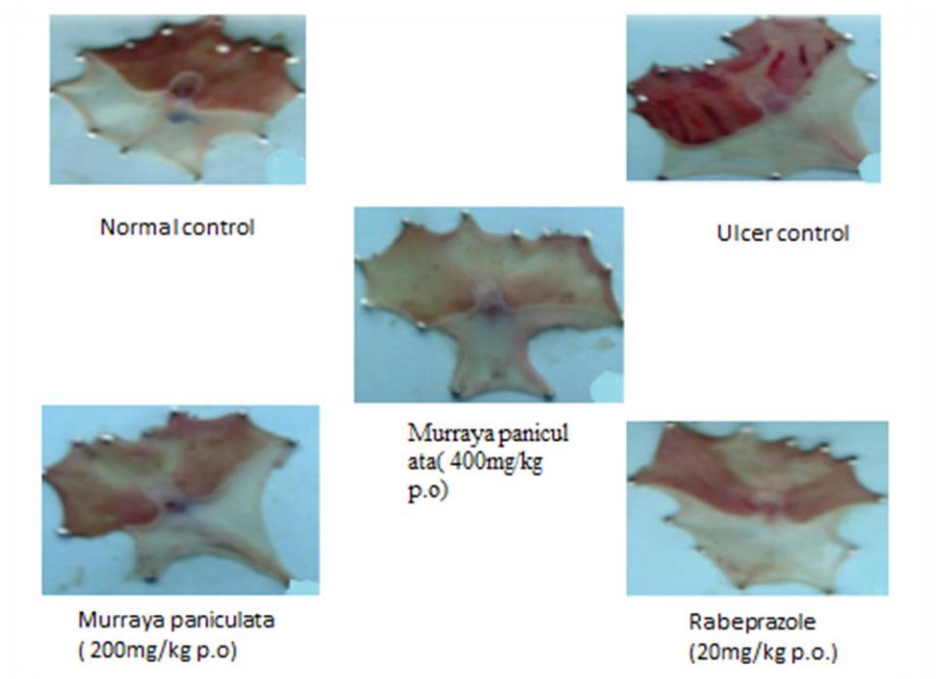

Figure 3.1: M. results of

paniculata L on ethanol induces gastric ulcer

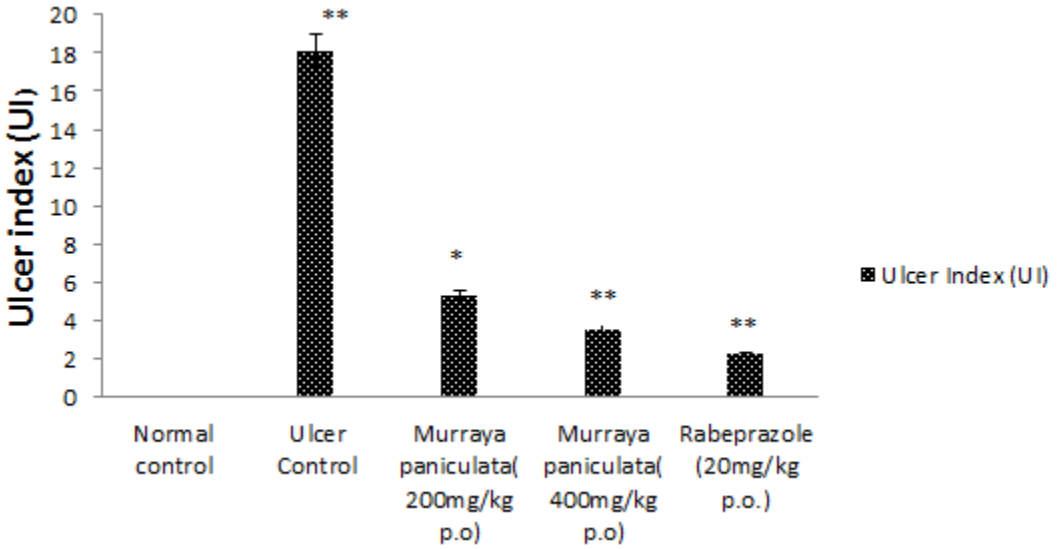

Figure 3.2: effect of Murraya paniculata L on ulcer index in ethanol induces gastric ulcer.

Ulcer index and (UI) and acid parameter:

Table 3.6: Effect Murraya paniculata L on gastricsecretion, total-acidity and freeacidity by ethanolic induce ulcer

S.No.	Groups	Gastricvolume-(ml/ 100ml)	pH of gastricjuice	Totalacidity	Freeacidity
1	Normalcontrol	1.30±0.30	1.90±0.29	78.49±4.55	47.36±2.46
2	Ulcer control	4.09±0.20***	2.16±0.12	101.12±9.66**	81.36±3.45***
3	Murraya paniculata(200mg/kg p.o)	2.19±0.34	2.02±0.14	53.49±3.46	30.89±1.36***
4	Murraya paniculata(400mg/kg p.o)	1.99±0.19***	2.98±0.33**	40.02±2.99***	25.64±1.07***
5	Rabeprazole (20mg/kg p.o.)	1.88±0.08***	2.80±0.33**	44.02±2.05***	26.46±0.77***

Each group's (n=5) animals are represented by the mean S.E.M. for all values. Ulcer-control group was associated to Normal-control group with ***P0.001, **P0.01. The ulcer control group and the rabepaarazole and extract cured groups are associated.

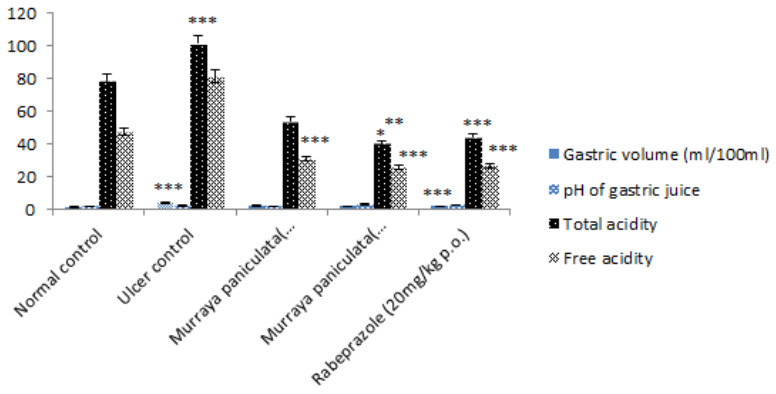

Figure 3.3: effect Murraya paniculata L on gastric-secretion, total-acidity and freeacidity with ethanolic-induce ulcer

Swimming stress induced ulcer:

Table3.9: Result of Murraya paniculata L on ulcerindex in water immersion-stress induces gastric-ulcer

S. No.	Groups	Ulcerindex (UI)	Percentage Inhibition %
1	Normalcontrol	00.00± 0.00	-
2	Ulcercontrol	27.77±6.12**	-
3	Murraya paniculata (200mg/kg p.o)	8.87±1.24*	53.21
4	Murraya paniculata(400mg/kg p.o)	4.01±1.78**	88.80
5	Rabeprazole (20mg/kg p.o.)	2.02±0.20**	93.76

Six animals made up each group, and all statistics were presented as meanS.E.M.With **P0.001, *P0.01, the ulcer control group was compared to the normal control group. The Rabeprazole and extract treated groups were compared to the ulcer control group.

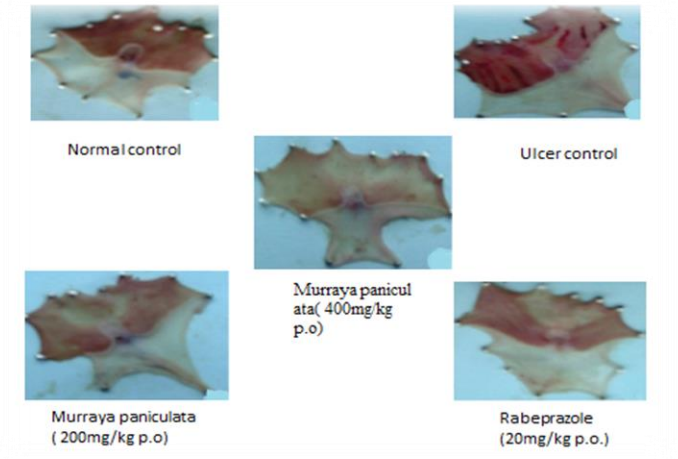

Figure 3.4: Result of Murraya paniculata L on stress induces gastric ulcer

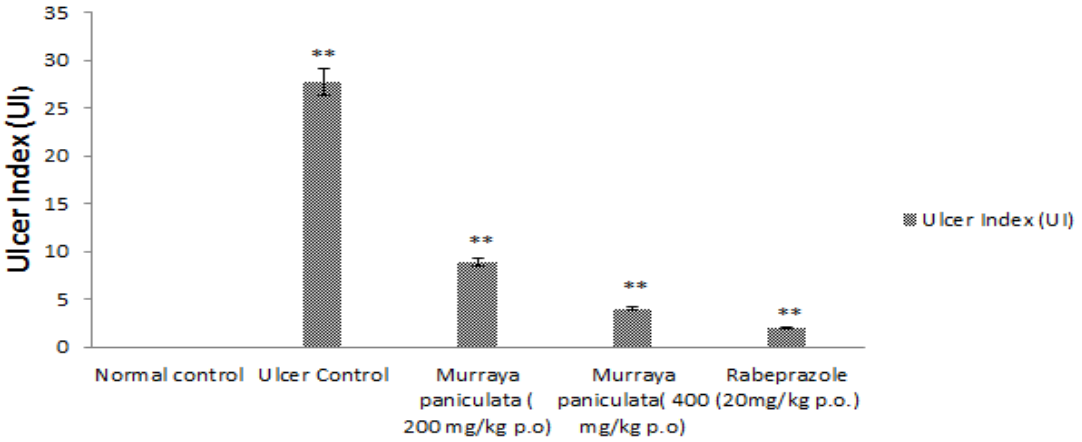

Figure 3.5: Result of Murraya paniculata L on ulcerindex in water-immersion stress induces gastric-ulcer

Conclusion:

The current examination is conducted to assess the anti-ulcer action of ethanolic of Murraya paniculata L. Pharmacognosticalal study on the leaves of Murraya paniculata L water-immersion stress-induced ulcers were minimized when Murraya paniculata L ethanolic extract was administered orally 1 hour before the induction of stress. At dosages of 200mg/kg Department of Pharmacology T.I.P.E.R Results and Discussion and 400 mg/kg, the ethanol extract of Murraya paniculata L showed a dosedependent inhibitory %es of 53.21 and 88.80. Rabeprazole, a common medication, displayed an inhibitory % of 93.76. The outcomes were displayed.

Water absorption stress was one of the greatest model for inducing ulcers in mice. The model causes stress in the animal on both an emotional and physical level. Rabeparazole was used in this study to examine how proton pump inhibitors function. Water-immersion stressinduced ulcers were brought on through the autdigestion of the stomach mucosal barrier and the buildup of HCl into the abdominal. Others the ethanolic extract of Murraya paniculata L reduces autodigestion of the stomach mucosal barrier in swimming stress-induced ulcers in a dose-dependent manner because of its cytoprotective action

The occurrence of alkaloids,saponins, flavonoids,terpenoids, tannins, cardiac glycosides, gums, and phytosteroids was discovered during the preliminary phytochemical examination.

The Flavonoids, tannins, terpenoids, and saponins have all been identified as potential gastro-protective agents in anti-ulcer research. Flavonoids, tannins, and triterpenes are examples of cytoprotective active substances with well-documented antiulcer genic activity.

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