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Research Article

Pharmacognostic Standardization and Phytochemical evaluation and Anti-Ulcer Activity of *Ocimum basilicum* leaf

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Abstract

The present investigation is to assess the antiulcer activity by utilizing natural remedy *Ocimum basilicum* . The chloroform extract of *Ocimum basilicum* treated groups demonstrates a huge impact when related to controller group animals. The acute toxicity study for chloroform extract of *Ocimum basilicum* indicates that, it is harmless till 400 mg/kg body weight. The chloroform extract of *Ocimum basilicum* at 250 mg/ kg dose has shown mucosal erosion, the partial healing of ulcer with few inflammatory cells and the dose 400 mg/kg has shown healing ulcer, mucosa and no inflammation of cells. *Ocimum basilicum* extracts reported to own antioxidant activity and to contain various types of compounds such as flavonoids, saponins and tannins. The gastro protective effect exhibited by chloroform extract *Ocimum basilicum* is speculated to be recognized for its antioxidant property, which in turn could be linked to existence of flavonoids and polyphenolic compounds, saponins and tannins. These compounds most likely inhibit gastric mucosal injury. The chloroform extract of *Ocimum basilicum* treated groups illustrate a major effect when related to control group animals which shows that the plant containing antiulcer action.

Keywords: *Ocimum basilicum* ; Antiulcer; Actue toxicity.

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1. Introduction

The stomach is a hollow organ that is part of the gastrointestinal system, and it is responsible for functions including the formation of chyme, synthesis of proteins necessary for vitamin absorption, microbial defenses, and propagates the peristaltic reflex. Contrary to popular thought, the stomach does not contribute to the absorption of any nutrients. This organ can is in the peritoneal cavity, located in the left upper abdominal quadrant or in the epigastric abdominal region that acts to relay ingested food between the nervous system and the endocrine system. Gastric acid secretion, peristaltic propulsion, and other physiologic functions of the stomach are finely controlled by the integration of the enteric nervous system, parasympathetic nervous system, and the secretion of various neurohormonal molecules (i.e., gastrin, HCl acid, intrinsic factor, bicarbonate, mucus, etc.) The stomach is susceptible to several primary pathologies that all manifest with similar symptomatology of epigastric pain, burning, gnawing discomfort, nausea/vomiting (+/- blood).

As a component of the alimentary canal (i.e., the tubal passageway for ingested food to be digested, absorbed, then excreted as waste), the stomach's physiological function is structured around creating an environment where the food ingested can be safely acted on by proteolytic enzymes and acidic solutions. There are pathologic consequences that can develop with the failure of the gastric mucosa to isolate the lumenal contents from the surrounding peritoneal cavity.

Ulcer is characterize as a break in the mucosa of the nutritious tract, which stretches out through the muscularis mucosa into the submucosa or more profound. It usually

happens within the abdomen and proximal small intestine, and generally less it happens in the lower throat, the distal duodenum, or the jejunum.There were two kinds of peptic ulcer: gastric ulcer, which caused because of harm to the coating of the stomach, and duodenal ulcer, related with inordinate corrosive emission by the stomach. Peptic ulcer was caused by a nonattendance of harmony between the stomachic forceful components and furthermore the layer cautious elements Peptic ulcer illness happens fundamentally because of utilization of NSAIDs (Nonsteroidal Anti- Inflammatory Drugs), smoking, liquor and disease by H. pylori, stress or because of pathological condition like Zollinger-Ellison Syndrome. Pain in the upper abdomen below the sternum (breastbone), it may occur most before meal or when we feel hungry other symptom bloating, dyspepsia, nausea, vomiting, poor appetite, weight loss and burping (belching) [1].

Previous works/literature provided information that, *Ocimum basilicum* can decrease the mucosal ulcers and peptic ulcers in alcohol, ethanol induced animals. In those works methanolic and ethanolic extracts of the plant leaves are used. In current work I intended to extract the material with chloroform (different solvents give different chemical constituents, as some Chemical constituents have more solubility in chloroform) and anti-ulcer activity will be screened in pylorus ligated animals these methods are never tried in the research work for anti- ulcer activity of *Ocimum basilicum* .

1.1 Plant profile

Ocimum basilicum

Basil is an annual, or sometimes perennial, herb. Depending on the variety, plants can reach heights of between 30 and 150 centimetres (1 and 5 feet).[6] Basil leaves are glossy and ovulate, with smooth or slightly toothed edges that typically cup slightly; the leaves are arranged oppositely along the square stems.[7] Leaves may be green or purple. Its flowers are small and white, and grow from a central inflorescence, or spike, that emerges from the central stem atop the plant. Unusual among Lamiaceae, the four stamens and the pistil are not pushed under the upper lip of the corolla, but lie over the inferior lip. After entomophilous pollination, the corolla falls off and four round achenes develop inside the bilabiate calyx.

1.2 Traditional uses

The Leafs, leaves, oil, and seeds square measure edible and employed by native individuals as people medicines within the treatment of jaundice, diabetes, ulcer, piles, colitis, insanity, cardiovascular disease, and skin diseases [3]. The Leaf pulp is employed as associate remedy, sedative, purgative, cooling, diuretic, antibilious, and pectoral. The flowers are an antidote to poison. Leaf juice is widely used for baldness [3, 4].

A wrapping of the crushed leaves has been applied to the head to treat headaches. Ocimum basilicum are traditionally used in the treatment of jaundice, diabetes, ulcer, piles, colitis, insanity, hypertension, congestive cardiac failure, and skin diseases. The Leaf pulp is used as an emetic, sedative, purgative, cooling, diuretic, antibilious, and pectoral. Its Leaf pulp is used both as an emetic and purgative, and for its cooling, diuretic, antibilious, and pectoral properties. Boiled in oil this pulp is used to treat rheumatism and insomnia.

2. Materials and Methods

2.1 Collection of plant material

The whole plant of *Ocimum basilicum* was collected from local fields and authenticated by Dr. K. Madhava Chetty, Department of Botany, Sri Venkateswara University, Tirupati, India.

2.2 Preparation of Plant material

The collected Leafs of *Ocimum basilicum were* washed with tap water. The plant Leafs were cut into pieces and air dried thoroughly under shade at room temperature for 1 month to avoid loss of phytoconstituents from sunlight. The shade dried materials were powdered using pulverizer and sieved through 80 mesh sieves. It was then homogenized to fine powder and stored in air tight container for further analysis

2.3 Physicochemical Investigations

Six samples of plant Leaf powder of *Ocimum basilicum were* subjected for determination of physicochemical parameters such as loss of drying, ash values, pH value in 1%, aqueous and methanolic extractive values were carried out according to the methods recommended by the World Health Organization.

2.3.1 Determination of pH range

The pH of different formulations in 1 % w/v (1g:100 ml) of water soluble portions of plants Leaf powder of *Ocimum basilicum* , were determined using standard simple glass electrode pH meter.

2.3.2 Loss of Drying/ Moisture Content (Gravimetric determination)

Seperately place about 1.0 gm of whole Leaf powder of the *Ocimum basilicum* in an accurately weighed moisture disc. For estimations of loss of drying, it was dried

at 105˚C for 5 hours in an oven, cooled in a desiccator for 30 minutes, and weighed without delay. The loss of weight was calculated as the content in mg per gm of air-dried material.

2.3.3 Determination of total Ash value

Incinerate 2gm. of powdered drug in a tarred silica dish at a temp. Not exceeding 4500c until free from carbon. Cool and weigh. If a carbon free ash cannot be obtained in this way, exhaust the charred mass with hot water, collect the residue on an ash less filter paper, incinerate the residue and filter paper add the filtrate, evaporate to dryness and ignite at a temp. Not exceeding 450˚c. Calculate the % of ash with respect to the air dried drug.

2.3.4 Determination of acid insoluble ash

Place the ash, as described earlier, in a silica dish, Add 25ml. Hydrochloric acid (2 N), cover with a watch glass, and boil for 10 min. and allow cooling. Collect the insoluble matter on an ash less filter paper, wash with hot Distilled water until the filtrate is neutral, dry, ignited to dull redness, allow cooling in a desiccator and weighing. Repeat until the difference between two successive weighing is not more than .1 g. calculate the %of acid insoluble ash with reference to the air dried drug.

2.3.5 Determination of Water insoluble ash

To silica dish containing the total ash, add 25ml. of water and boil for 15 min. collect the insoluble matter in ash less filter paper. Wash with hot water and ignite in a silica dish for 15min. at a temp. Not exceeding 4500c. Subtract the weight of this residue from the weight of total ash. Calculate the value of water soluble ash with reference to air dried drug.

2.3.6 Fluorescence Studies of Powder Drugs

A pinch of dried and powdered plant material was taken in a clean slide with about 1-2ml of solvent like acetone, benzene, petroleum ether chloroform, ethanol, glacial acetic acid, HCl, HNO3, methanol and distilled water. All the slides were shaken well and incubated for about 30 min. The colors of the drug solutions thus obtained were observed for their characteristic color reaction under the visible light (fluorescent tube) and ultra violet light (UV366nm).

2.3.7 Determination of Sulphated ash

Ignite a suitable crucible at 550˚ C to 650˚ C for 30 minutes, cooled the crucible in a desiccators and weighed accurately. 1 gm of plant powder of *Ocimum basilicum* was placed in a previously ignited crucible, ignited gently at first, until the substance was thoroughly white. Cooled and moistened the sample with a small amount (usually 1 ml) of sulphuric acid. Sample heated gently at a temperature as low as practicable unit of sample is thoroughly charred. After cooling , moistened the residue with a small amount (usually 1 ml)of sulphuric acid, heated gently until white fumes were no longer evolved, and ignited at 800℃ +25℃ until the residue is completely incinerated Ensure that flames were not produced at any time during the procedure. Cooled the crucible in a desiccators, weighed accurately. This was repeated until the sample reaches a constant weight and calculated the percentage of residue.

2.4 Preparation of Plant extracts

The plant Leaf powder of *Ocimum basilicum* Were extracted with ethyl acetate, methanol, and water using as solvent respectively. A total of 50 gm of individual plant powder of the *Ocimum basilicum* was taken and mixed with 250 ml distilled water (1:5) in a round bottom flask and gentle refluxed for 1.5 hour separately. The residue was removed by filtration through Whatmann No. 1 filter paper and the aqueous extract was concentrated on rotary evaporator to get solid yield extract.

2.5 Preliminary Phytochemical Screening

Preliminary screening of phytochemicals is a valuable step, in the detection of bioactive principles present in medicinal plants and subsequently may lead to drug discovery and development. It refers to extraction , screening and identification of the medicinally active substances found in plants. The preliminary screening of the ethyl acetate, methanol and water extracts of plant powder of *Ocimum basilicum* were carried out using standard laboratory procedures to detect the presence of different secondary metabolites such as alkaloids, flavonoids, saponins, tannins, steroid glycosides, phenols, coumarins, reducing sugars , protein, fixed oils and fats.

2.6 Pharmacological Evaluation for Antiulcer Activity:

2.6.1 Acute toxicity studies:

The point of performing acute toxicity investigations is to build up Therapeutic Index (TI) of a specific drug and to ensure the wellbeing *in vivo*. Intense danger examine dependent on OECD (Organization for Economic Co-operation and Development) rule 423 is made for the assurance of LD50 (Lethal Dose) esteem in test creatures.

Requirements

Animal: Wistar rats, 150-200 gm.

Drugs/Extracts: Extracts of *Ocimum basilicum* .

Procedure:

The overnight not eat rats were weighed up and selected. The extracts were dosed in a stepwise procedure, with the initial dose being selected as the dose expected to produce some signs of toxicity and were observed for a time of 14 days. The toxic doses were selected based on the Guideline 423.The Wistar rodents of single sex, weighing between 150 to 200 g were chosen and separated in to 5 bunches each comprising of 5 creatures. They were kept up under standard conditions (room temperature at 22 ± 3℃, 12 h light/dull) and enabled free access to water alongside

standard pelleted diet for multi week before the investigation. The creatures were oppressed for intense danger think about utilizing each concentrate at a portion of 2000 mg/kg orally in 5 gatherings and seen at regular intervals of 1, 2, 4, 8, 12 and 24 h for skin changes, horribleness, forcefulness, increase oral secretion, affectability to the sound and pain and respiratory developments and mortality.

2.6.2 Design of pylorus-ligation induced gastric ulcer

The Wister rats were unsystematically divided into 4 groups of 6 animals each, as given in table 1. Creatures were fasted for 24 h prior experiment, with access to water

Experimental procedure

The control assembles treated with ordinary saline as it were. Second, third, fourth gatherings of creatures were treated with ranitidine through p.o, low and high portions of concentrates separately 1 h before pylorus ligation upon the arrival of analysis at around 10 AM. Following 1 h of medications treatment, creatures were anesthetized with the assistance of analgesic ether the stomach area was opened by a little midline cut underneath the xiphoid process.

The stomach area was replaced thoroughly and in this manner the divider was shut by interfered with sutures. The abdomen was opened, viscous finish of the abdomen was cleft out and therefore the substances were taken into a glass tube. The volume of the stomach related liquid was estimated and centrifuged at 2000 rate for 10 min. From the supernatant, aliquots (1 ml of each) were engaged for the assurance of pH scale, total and free acidity. Each abdomen was analyzed for sores inside the fore stomach area divide and ranked based on the severity.

Estimated Parameters:

Estimation of gastric volume, pH:

The gastric substance that was moved into rotator tubes was utilized for estimation of gastric volume, pH. The cylinders were centrifuged at one thousand cycles for each moment for ten min and furthermore the stomachic volume was specifically discussed from the graduation on the cylinders [8-10]. The supernatant was then gathered and pH scale resolve by utilizing

a computerized pH scale meter.

Determination of total acidity:

An aliquot of 1 ml gastric juice weakened with 1ml of refined water was taken into a 50 ml cone shaped flask and two drops of phenolphthalein marker was added to it and titrated with 0.01N NaOH till lasting pink shading was recognized. The volume of 0.01N NaOH spent was noted.

Determination of free acidity:

As a substitute of phenolphthalein marker, the Topfer's reagent was utilized. Aliquot of gastric juice was titrated with 0.01N NaOH until the point when canary yellow shading was watched. The volume of 0.01N NaOH expended was noted. The free corrosiveness was determined by a similar equation for the assurance of absolute sharpness. Acridity was communicated as underneath.

$$\text{Acidity} = \frac{\text{Volume of NaOH} \times \text{Normality} \times 100}{0.1} \; mEq/1Lit/100\ gm$$

Determination of Ulcer Index (UI):

The ulcer index was considered by severity of stomachic tissue layer and sorted as follows:

0= no ulcer; 1= superficial ulcers; 2= deep ulcer; 3= perforation

UI=UN+US+UP × 10-1

Where, UN=average of no. of ulcers per animal

US=average of severity score

UP=Percentage of animals with ulcers

% gastro protection was calculated according to,

% gastro protection=(UIC-UIT)/UIC*100

Where, UIC-Ulcer Index of Control.

UIT - Ulcer Index of Test.

Histopathological approach to rat stomach Procedure

The rodents were executed by cervical disengagement and separated. The stomachs were expelled from the staying gastrointestinal tract, leaving 2 cm of the throat and duodenum appended. The duodenum was ligated with careful string and each midsection delicately loaded up with 0.9% NaCl. This caused the expansion of the stomach avoiding contact of the neighbouring dividers. The stomachs were then ligated at the throat, at that point solidified in icebox and put away at 20°C [13-15]. Sequential cryostat cross-segments of 15 to 20 µm of the full stomach area were cut inside the plane from the lesser to the greater curvature. This segment thickness was picked as it was adequately enough to hold the bodily fluid layer and empower the representation of the mucosal structure.Then place the tissue into Hematoxylin recolor for 1-2 min. Now, expel it from Hematoxylin recolor and again hold it under faucet water for 1-2 min.

Plunge the slides containing tissue areas into 1N HCl pursued by Scott's water (Sodium Bicarbonate 3.5 g, Magnesium sulfate 20 g, refined water 1 L) for 1 min each. Dip the tissue in Eosin recolors for 30 sec. Dehydrate the tissue logically with 80%, 90%, 100% isopropyl alcohol ultimately with Xylene for 20-30 min. Place coverslip on the slides using one drop of DPX, taking consideration to leave no air pockets and dry medium-term to make the enduring slide.

Statistical analysis:

The qualities are communicated as mean esteem ± standard deviation (SD). The information was assessed by methods for the SPSS (form 12.0) and one-way ANOVA, trailed by bonferroni t-test. Measurable criticalness was viewed as when estimation of P 0.05.

3. Result and Discussion

3.1 Phytochemical Analysis

Physicochemical parameters were determined as per guidelines of WHO, air dried coarse powdered sample of *Ocimum basilicum* were subjected for determination of physicochemical parameters such as pH, foreign Organic matter, methanol soluble extractives, water soluble extractives, total ash content, acid insoluble ash, water soluble ash, loss on drying, fluorescence values and % moisture content were determined.

Table 1: Physicochemical Parameters of *Ocimum basilicum* Leaf

S.N.	Parameters	Values
1	pH range	4.25±0.01
2	Loss on drying	8.25±0.10
3	Methanol soluble extractive value	18.54±0.40
4	Water Soluble extractive value	23.15±0.50
5	Total ash value	8.5%
6	Water soluble ash	5.5%
7	Acid insoluble ash	1.0%
8	Sulphated ash	1.04±0.30

Table 2: Fluorescence properties of *Ocimum basilicum*

Sr. No.	Materials/Treatment	Visible	Short UV	Long UV
1.	Drug Powder as such	Yellowish-Brown	LightGreen	Creamy
2.	Drug Powder rubbed on filter paper	Yellow	Green	Black
3.	Powder treated with1M NaOH in water	Brown	Dark-Green	Dark-Green
4.	Powder treated with1M HCl	Yellowish-Brown	Green	Dark-Green
5.	Powder treated with Pet.Ether	Brown	Light-Green	White
6.	Powder treated with HNO_3	Light-Brown	Light-Green	Dark-Brown
7.	Powder treated with 5% $Fecl_3$	Yellowish-Brown	Dark-Green	Black
8.	Powder treated with dil.Ammonia	Light-Brown	Light-Green	Dark-brown
9.	Powder treated with Methanol	Light-Brown	Light-Brown	White
10.	Powder treated with 1M H_2SO_4	Light-Brown	Green	Gray
11.	Powder treated with Ethanol	Light-brown	Light-Green	White
12.	Powder treated with KOH	Brown	Dark-Green	Dark-Brown
13.	Powder treated with Chloroform	Light-Brown	Light-Brown	White

Table 3: Different Phytochemical present in different extracts of *Ocimum basilicum*

Sr. No.	Name of the Chemical test	Aqueous Extract	Methanolic Extract	Ethanolic Extract	Chloroform Extract
1.	**TestforFlavonoids**				
(a)	Shinodatest	+	+	+	-
(b)	Alkalinereagenttest	+	+	+	-
(c)	Zinchydrochloridetest	+	+	+	-
2.	**TestforSaponins**				
(a)	Foamtest	+	+	+	
3.	**TestforAlkaloids**				
(a)	Dragendroff'stest	-	-	-	-
(b)	Mayer'stest	-	-	-	-
4.	**TestforSteroid**				
(a)	Salkowskireaction	+	+	+	+
(b)	Liebermann-Burchard reaction	+	+	+	+
5.	**Testforamino-acids**				
(a)	Ninhydrin test	+	+	+	+
6.	**TestforCarbohydrate**				
(a)	Molish'stest	+	+	+	+
7.	**TestforProteins**				
(a)	Biurettest	+	+	+	+
(b)	Million'stest	+	+	+	+
8.	**TestforTannins**				
(a)	Drug+5%$FeCl_3$	+	+	+	+
(b)	Drug+leadacetate solution	+	+	+	+
9.	**Testforvit. C**	+	+	+	+

(+)= Present; (-)=Absent

Various extract of *Ocimum basilicum* Leafs were prepared and tested for phytochemical screening. The studyshowed the presence of flavonoids, carbohydrates, amino acids, tannins, saponins, proteins, steroids and vitamin C.

3.2 Pharmacological Studies

3.2.1 Acute toxicity studies:

The chloroform extract of *Ocimum basilicum* was underwent acute toxicity study to determine the healing dose utilizing Wister rats in controlled condition. Acute oral toxicity study was executed according to OECD-423 guidelines. Acute toxicity study completed on CELS up to dose of 250 mg/kg demonstrated that the extract did not show any sign of harmfulness and mortality. Thus, 250 and 400 mg/kg dose of the concentrate chosen for examination of anti-ulcer activity.

3.2.2 Effect of chloroform extract of *Ocimum basilicum* in pylorus ligation induced gastric ulcer

The Ulcer index of toxic control group 5.5 ± 0.6007. The creatures treated with chloroform extract of *Ocimum basilicum* at 400 mg/kg dose displayed significant (*P<0.01*) drop in the no. of ulcers and ulcer index is 2.21 ± 0.6668. *Ocimum basilicum* extract produced a dose reliant on and major decrease in the ulcer index. Extract at 250 mg/kg shows the safety against the pylorus ligation induced gastric ulcer, ulcer index 1.990 ± 1.199. Here also, maximum protection was seen in the ranitidine treated group. The volume of gastric secretion and total acidity, free acidity was significantly reduced in all extract treated groups when contrasted with toxic control. *Ocimum basilicum* in the highest dose tested (400 mg/kg) was quite significant to ranitidine in reducing the gastric volume, and total acidity. Gastric pH was also observed to be essentially increased in all extract treated groups when contrasted with control (Table 4; Figure 2)

3.2.3 Pylorus Ligation Parameters

Volume of gastric content

In the present model, the gastric content volume high (4.2 ± 0.1132) in control group. Gastric content volume significantly decreases in chloroform extract of *Ocimum basilicum* at 250 (2.653 ± 0.234) and 400 mg/kg (2.195 ± 0.1946) doses. Gastric content volume significantly decreases in standard group (2.093 ± 0.195) compared control group (Table 4;Figure 5).

Volume of gastric juice

In pylorus ligation induced gastric ulcer model the Gastric juice volume high (2.285 ± 0.1022) in control group. Gastric juice volume significantly decreases in chloroform extract of *Ocimum basilicum* at 250 (1.6 ± 0.2816) and 400 mg/kg (2.292 ± 0.1326) doses. Gastric juice volume significantly decreases in standard group (1.03 ± 0.09465) compared control group (Table 4; Figure 1).

pH: In pylorus ligation induced gastric ulcer model the Gastric juice pH low (2.865 ± 0.1018) in control group. Gastric juice pH significantly increases in chloroform extract of *Ocimum basilicum* at 250 (3.75± 0.1993) and 400 mg/kg (4.76 ± 0.1995) doses.

Table 4 : Effect of chloroform extract of Ocimum basilicum on ulcer index and % ulcer protection in pylorus ligation induced gastric ulcer

S. No	Groups (n=5)	Treatment	UI	% ulcer protection
1	I	Toxic control	5.56 ± 0.6007	0
2	II	Standard	2.435 ± 0.4943**	56.2
3	III	*Ocimum basilicum* 250 mg/kg	1.990 ± 1.199ns	64.208
4	IV	*Ocimum basilicum* 400 mg/kg	2.21 ± 0.6668**	60.25

*Values express as mean ± SEM; n=6 in each group, statistical comparisons as follows: Significant at P<0.01** compared to control group, P>0.05 ns: non-significant.

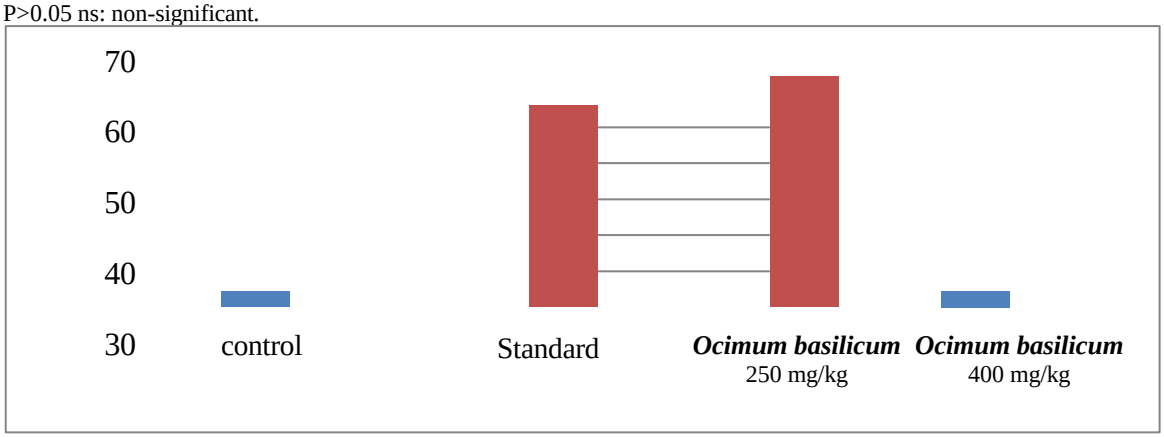


Figure 1: Effect of chloroform extract of *Ocimum basilicum* on ulcer index in pylorus ligation induced gastric ulcer.

Table 5: Effect of chloroform extract of *Ocimum basilicum* on gastric juice volume

S.No.	Groups	Treatment	Volume of gastric content
1	I	Control	4.15 ± 0.1132
2	II	Standard	2.174 ± 0.195**
3	III	*Ocimum basilicum* 250 mg/kg	2.554 ± 0.234**
4	IV	*Ocimum basilicum* 400 mg/kg	2.187 ± 0.1946**

Values express as mean ± SEM; n=6 in each group, statistical comparisons as follows: significant at P<0.01** compared to control group.

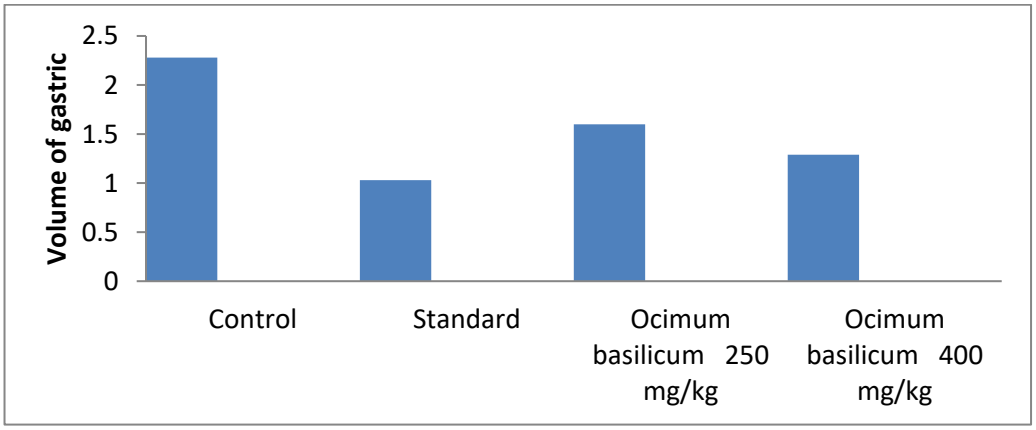


Figure 3. Effect of chloroform extract of *Ocimum basilicum* on gastric juice volume

Table 6. Effect of chloroform extract of *Ocimum basilicum* on gastric juice pH.

S. No	Groups	Treatment	pH
1	I	Control	2.865 ± 0.1018
2	II	Standard	4.15 ± 0.1766**
3	III	*Ocimum basilicum* 250 mg/kg	3.75 ± 0.1993**
4	IV	*Ocimum basilicum* 400 mg/kg	4.76 ± 0.1995**

Values express as mean ± SEM; n=6 in each group, statistical comparisons as follows: significant at P<0.01** compared to control group

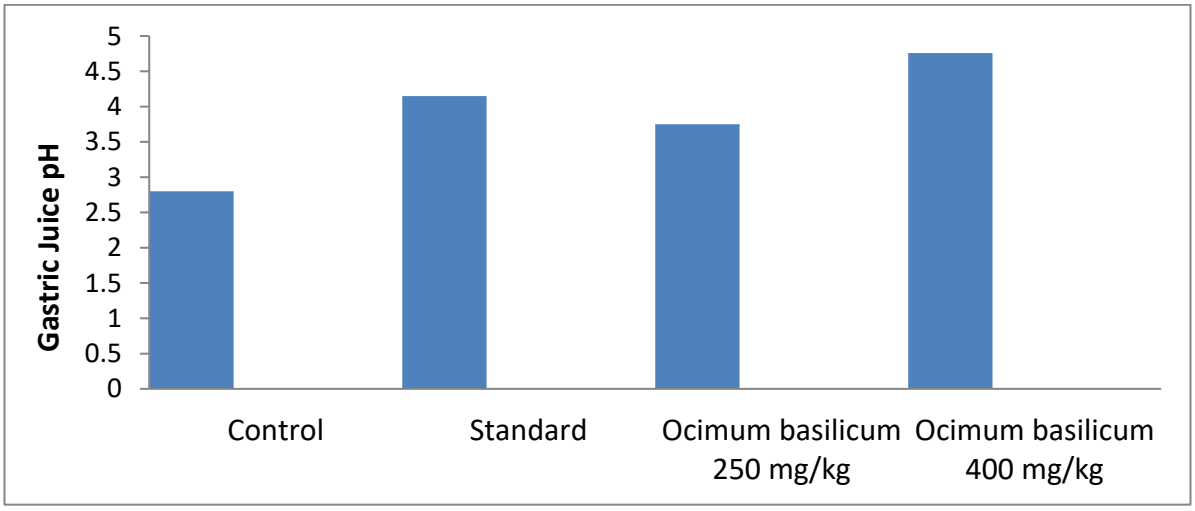
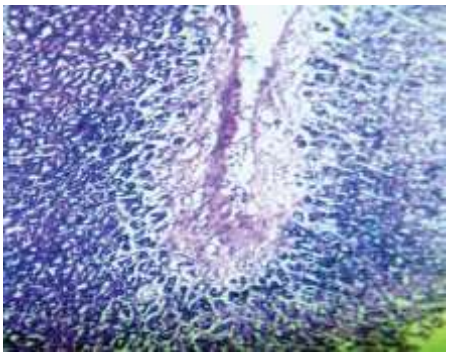
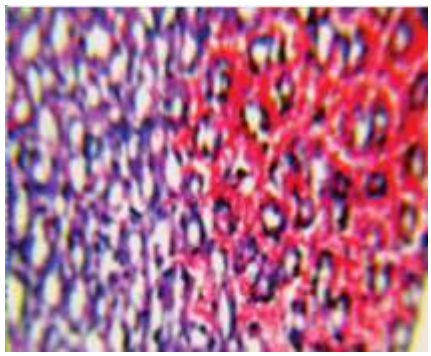


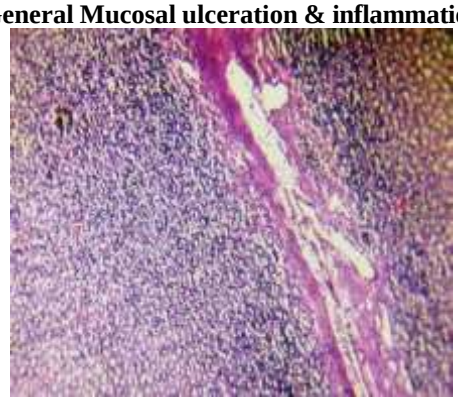
Figure 4. Effect of chloroform extract of *Ocimum basilicum* on gastric juice pH.



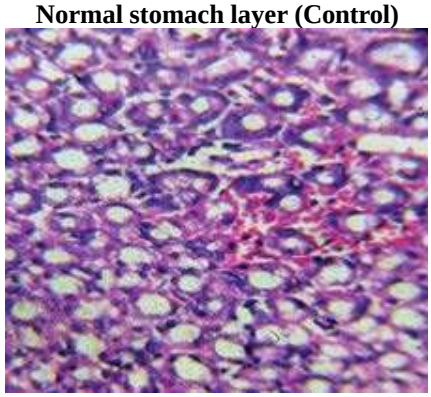
General Mucosal ulceration & inflammation



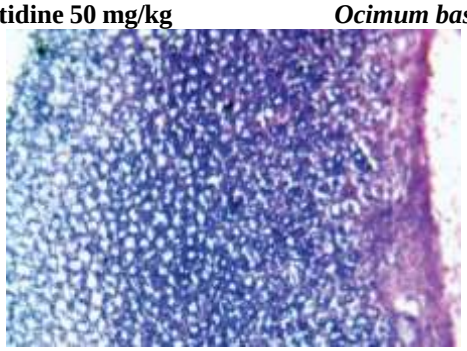
Normal stomach layer (Control)



Standard ranitidine 50 mg/kg



***Ocimum basilicum* 250 mg/kg**



***Ocimum basilicum* 400 mg/kg**

Figure 5: Histopathological photographs of pylorus ligation induced ulcer in rats.

4. Conclusion

In the present work, the acute toxicity carried out based on OECD-423 rules for chloroform extract of *Ocimum basilicum* prove that, the doses of 250 and 400 mg/kg did not indication any sign of toxicity and mortality. Hence these doses of the concentrate chosen for assessment of anti-ulcer activity. *Ocimum basilicum* in the highest dose tested (400 mg/kg), shows increased in Gastric pH and Gastric juice pH, whereas decrease in Gastric content, Gastric juice volume and Total acidity. Therefore, as per histopathological evaluation studies, it was concluded that, *Ocimum basilicum* , at the highest dose of 400 mg/kg, found to be safe and more effective in eradicating gastric ulceration. In Conclusion, based on the results obtained the chloroform extract of *Ocimum basilicum* treated groups demonstrates a critical impact when contrasted with control group animals which showing that the plant having the having the anti-ulcer activity.

The anti ulcer action of *Ocimum basilicum* was assessed by pylorus ligation instigated ulcer models. These models cause the gastric ulcer in people. Numerous variables and instruments are associated with the ulcerogensis and gastric mucosal harm [17- 19].

Pylorus ligation induced ulcer was utilized to note the impact of *Ocimum basilicum* extract on gastric acid secretion and bodily fluid emission [19, 20]. The ligature of the opening finish of the abdomen causes accumulation of internal organ acid within the abdomen. This increase within the internal organ acid secretion causes ulcers within the abdomen. Ligation of pyloric end of the stomach is made in 24 h fasted rats, the UI is resolved 4 h after pylorus ligation [21].

The lesions created by this methodology are placed inside the lumen area of abdomen. The Chloroform extract of *Ocimum basilicum* and ranitidine altogether diminished the complete acidity, free acidity and significantly enhance the pH, this proposes it is having an anti-secretory effect [22]. Its antiulcer activity is any supported by histopathological study demonstrates that protection of tissue layer layer from ulceration and inflammation.

Pylorus ligature induced lesion management rats shown perforated lesion, deep ulceration of granular epithelial tissue and nearly reducing the sub- mucosa. The chloroform extract of *Ocimum basilicum* at 250 mg/kg dose has shown mucosal erosion, the partial healing of ulcer with few inflammatory cells and the dose 400 mg/kg has shown the healed ulcer, normal mucosa and no inflammatory cells. *Ocimum basilicum* extracts have been reported to possess antioxidant activity and to contain various types of compounds such as flavonoids and polyphenolic compounds, saponins and tannins [23]. The gastroprotective effect exhibited by chloroform extract *Ocimum basilicum* is speculated to be attributed to its antioxidant property, which in turn could be linked to the presence of flavonoids and polyphenolic compounds, saponins and tannins [16]. These compounds most likely inhibit gastric mucosal injury.

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References

[1]. Gustaf E, Henrik H, Klaus R, Rut N, Agneta W, Mads M, Olof N. Risk of Gastric Cancer and Peptic Ulcers in Relation to ABO Blood Type: A Cohort Study, 172(11) ,451-59,2010.

[2]. Correa P, Haenszel W, Cuello C. A model of gastric cancer epidemiology. *Lancet* 2, 58-60, 1975.

[3]. Yamaoka Y, Ojo O, Fujimoto S. *Helicobacter pylori* outer membrane proteins and gastroduodenal disease. *Gut*. 55:775-811975.

[4]. Atherton JC, Peek RM, Tham KT, Cover TL, Blaser MJ. Clinical and pathological importance of heterogeneity in *vacA*, the vacuolating cytotoxin gene of *Helicobacter pylori*. *Gastroenterology*. 112, 92–99, 1997.

[5]. Atuma C, Engstrand L, Holm L. Extracts of *Helicobacter pylori* reduces gastric mucosal blood flow through a VacA- and CagA-independent pathway in rats. *Scand. J. Gastroenterol*. 33, 1256–61,1998.

[6]. Enno A, O'Rourke JL, Howlett CR, Jack A, Dixon MF, Lee A. MALToma-like lesions in the murine gastric mucosa after long-term infection with *Helicobacter felis*. A mouse model of *Helicobacter pylori*-induced gastric lymphoma. *Am. J. Pathol.* 147,217–22, 1995.

[7]. Warren JR, Marshall BJ. Unidentified curved bacilli on gastric epithelium in active chronic gastritis. *Lancet.* 2(3), 1273–75, 1983.

[8]. Patchett S, Beattie S, Leen F. Helicobacter *Pylori* and Duodenal Ulcer Recurrence. *Am J Gastroentrol*.87, 24-7, 1992.

[9]. Konturek PC, Ernst H, Konturek SJ. Bobrzynski AJ, Faller G, Klingler C, Hahn EG.Mucosal expression and luminal release of epidermal and transforming growth factors in patients with duodenal ulcer before and after eradication of *Helicobacter pylori*. Gut. 40,463–69, 1997.

[10]. Warburton VJ, Everett S, Mapstone NP, Axon AT, Hawkey P, Dixon F. Clinical and histological associations of cagA and vacA genotypes in *Helicobacter pylori* gastritis. *J. Clin. Pathol.* 1, 51:55–61,1998

[11]. Graham DY. Pathogenic mechanisms leading to *Helicobacter pylori*-induced inflammation. 4(2), 9–16, 1975.

[12]. Tovey FI, Hobsley M, Kaushik SP. Duodenal gastric metaplasia and *Helicobacter pylori* infection in high and low duodenal ulcer-prevalent areas in India. *J Gastroenterol Hepatol.* 19,424-30,2004.

[13]. Mayerle J, den Hoed CM, Schurmann C. (2013). Identification of genetic loci associated with *Helicobacter pylori* serologic status. *JAMA*. 309,1912-20,2013. Salama NR, Hartung M, Müller A.Life in the human stomach: persistence strategies of the bacterial pathogen *Helicobacter pylori*. *Nat Rev Micobiol*. 11,385-99,2013.

[14]. Kimura K: (1972). Chronological transition of the fundic-pyloric border determined by stepwise biopsy of the lesser and greater curvature of the stomach. *Gastroenterology. 89*,584-92.

[15]. Ernst, P. B., Y. Jin, J. Navarro, V. Reyes, a S. Crowe. Overview of the immune response to *H. pylori*, *J Immune* .14, 295–305.1994.

[16]. William DC, Grigorios IL, Colin WH, Steven FM, ACG Clinical guidelines: treatment of H.pylori infection. *The Am J Gastro*.112, 212-39, 2017.

[17]. Francois F, Blaser M. Improving Helicobacter pylori Eradication Regimens. *Annals of Internal Medicine* 144, 140, 2006.

[18]. Gisbert JP, González L, Calvet X, García N, López T, Roqué M. Proton pump inhibitor, Azithromycin and either amoxycillin or nitroimidazole: A meta-analysis of eradication of *Helicobacter pylori*. *Aliment Pharmacol Ther.* 14,1319–28.2000

[19]. VanDoorn LJ. Detection of *Helicobacter pylori* virulence-associated genes. *Expert Rev Mol Diagn*. 1,290–98, 2001.

[20]. Laine L, Fennerty MB, Osato M, Sugg J, Suchower L, Probst P, et al. Esomeprazole-based *Helicobacter pylori* eradication therapy and the effect of antibiotic resistance: Results of three US multicenters, double-blind trials. *Am J Gastroenterol*. 95,3393–98, 2000.

[21]. Telford JL. Covacci A, Ghiara P. Unravelling role of helicobacter pylori in peptic ulcer: potential new therapies and vaccines. *Trend Biochem.*12:420-6, 1994.

[22]. *Helicobacter pylori*. Helicobacter. 12:31–37,2007 Dore MP, Maragkoudakis E, Pironti A, Tadeu V, Tedde R, Realdi G, et al. Twice-a-day quadruple therapy for eradication of *Helicobacter pylori* in the elderly. *Helicobacter*. 11:52–5, 2006.

[23]. Egan BJ, Katicic M, O'Connor HJ, O'Morain CA. Treatment of *Helicobacter pylori*. Helicobacter. 12,31–37,2007

[24]. Graham DY, Fischbach L. *Helicobacter pylori* treatment in the era of increasing antibiotic resistance. *Gut.* 59,1143–53.2010

[25]. Gisbert JP, Pajares JM. *Helicobacter pylori* rescue therapy after failure of two eradication treatments. Helicobacter. 10,363–72.2005.

[26]. Cammarota G, Martino A, Pirozzi G, Cianci R, Branca G, Nista EC.High efficacy of 1-week doxycycline-and amoxicillin-based quadruple regimen in a culture-guided, third-line treatment approach for *Helicobacter pylori* infection. *Aliment Pharmacol Ther.* 19,789–95,2004

[27]. Garg S, Sharma S. Gastroretentive drug delivery systems. *Business Briefing: Pharmatech*. 160-66,2003.

[28]. Umamaheshwari RB, Jain S, Jain NK. A new approach in gastroretentive drug delivery system using cholestyramine. *Drug Deliv.* 10,151–60, 2003.

[29]. Iannucelli V, Coppi G, Bernabei MT, Camerorni R. Air compertment multiple-unit system for prolonged gastric residence. Part-I. Formulation study. *Int J Pharm* . 174, 47-54, 1998.

[30]. Ghule BV, Ghante MH, Saoji AN, et al. (2007) Diuretic activity of *Ocimum basilicum* Leaf extract in rats. *Int J Pharm Sci* 69: 817–819.

[31]. PK, Jain SK, Lal N, et al. (2012). A Review on Antiulcer Activity.*IJPSR*. **3**: 2487-2493.

[32]. Upaganlawar A, Balaraman R. (2009). Bottle Gourd (*Ocimum basilicum*)-A vegetable foodfor human health"- A Comprehensive Review. *Pharmacologyonline.* **1**: 209-226.

[33]. Prashar Y, Gill NS, Perween A. (2014). An Updated Review on Medicinal Properties of *Ocimum basilicum* . Int Universal Pharmacy Bio Sci. **3**: 362-376.

[34]. Prajapati RP, Kalaria MV, Karkare VP, et al. (2011).Effect of methanolic extract of *Ocimum basilicum* (Molina) Standley Leafs on marble-burying behaviour in mice: Implications for obsessive-compulsive disorder. *Pharmacognosy Res.* **3**: 62–66.

[35]. Khalid S, Shahzad A, Basharat N, et al. (2018).'Phytochemical Screening and Analysis of Selected Medicinal Plants in Gujrat'. *J Phytochemistry Biochem* **2**: 108.

[36]. Prajapati RP, Kalariya M, Parmar SK, et al. (2010). Phytochemical and pharmacological review of *Lagenaria sicereria*, *J Ayurveda Integr Med*. **1**: 266–272.

[37]. Rao NV, Venu K, Sowmya U, et al. (2011).'Evaluation of anti -ulcer activity Of *Momordica* Charantia in rats'. *Int J Int J Pharm Bio Sci.***1**: 1-16.

[38]. Gupta1 J, Kumar D, Gupta A. (2012). Evaluation of gastric anti-ulcer activity of methanolic extractof *Cayratia trifolia* in experimental animals. *Asian Pac J Trop Dis.* 99-102.