ISSN: 0976-7126
Ram & Dubey, 15(7):28-38, 2024

International Journal of Pharmacy & Life Sciences
Open Access to Researcher

Anti-ulcer Activity of *Ocimum sanctum* leaves and *Ficus benghalensis* Linn. Stem bark Ethanolic Extract in Rats

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Article info

Received: 15/05/2024

Revised: 12/06/2024

Accepted: 15/07/2024

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Abstract

The study aimed to determine whether *Ocimum sanctum* leaves and *Ficus benghalensis Linn* stem bark ethanolic extraction might help the rats with gastric ulcers. Given *sanctum leaves and* Ficus benghalensis Linn stem bark ethanolic extract dose at 250mg/kg, 500mg/kg, & 1000 mg/kg thrice a day for tenure of five days before pyloric ligation ulceration and indomethacin-induced ulceration; anti-ulcer activity was assessed. Several parameters, including "gastric volume, pH of gastric juice, total acidity, ulcer index, and histopathological parameters," were assessed in the controller groups before they received pretreatments of an ethanolic extract of *sanctum leaves and Ficus benghalensis* stem bark and the commonly used drugs ranitidine. In the indomethacin and pyloric ligation model, pre-treatment with an ethanolic extract of Ocimum *sanctum leaves* and *Ficus benghalensis* Linn stem bark and ranitidine significantly decreased the ulcer index and free acidity as compared to the control group. Percentages of ulcer prevention were calculated. The extract improved pH significantly (P0.05) and lowered gastric juice volume, accessibility, and overall acidity. Histopathological findings from albino Wistar rats reveals the ethanolic extraction of *sanctum leaves* and *Ficus benghalensis* Linn stem bark had anti-ulcer activities. The ethanolic extract under *Ocimum sanctum* leaves and *Ficus benghalensis* Linn stem bark exhibited anti-ulcer activity in two model.

Keyword: GRDDS, Floating Microsphere, Antibiotics, Cephalexin, Bioavailability, Polymers.

Introduction

Gastric ulcers are caused by ulcer formation in the stomach and are among the most common stomach diseases. There is a loss of mucosa in both the stomach and the duodenum behind it. Gastric acid sequestration reveals what are essentially peptic ulcers in the digestive tract. Most ulcers are of two types: duodenal ulcers and peptic ulcers. Such acute ulcer elements increase HCl formation and the lack of mucosal protection. Deficiencies and excesses in defensive and aggressive behaviour are other causes of ulcers.

A variety of human diseases are treated with medicinal plants. ocimum sanctum and *Ficus benghalensis* often known as Bargad, is a Moraceae-family species found in Indian woodlands. Old medicine has traditionally used the plant's leaves and delicate branches. The plant contains hepatoprotective, antibacterial, antioxidant, analgesic, glucose-lowering, and hepatoprotective properties. “This study looked at the antiulcer effectiveness of *Ocimum sanctum* and *Ficus benghalensis* stem bark ethanolic extraction.”

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Peptic ulcers are open sores that develop on the inside lining of your stomach and the upper portion of your small intestine. The most common symptom of a peptic ulcer is stomach pain.

The most common causes of peptic ulcers are infection with the bacterium Helicobacter pylori (H. pylori) and long-term use of nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen (Advil, Motrin IB, others) and naproxen sodium (Aleve). Stress and spicy foods do not cause peptic ulcers. However, they can make your symptoms worse. In the present investigation anti-ulcer activity of these two plants were investigated.

Material and method

Process of Drying *Ocimum sanctum* (leaves) and *Ficus benghalensis* Linn (Bark)

Ocimum sanctum leaves and bark of *Ficus* was dried at average room temperature.

Reduction in the size of the *Ocimum sanctum* (leaves) *and Ficus benghalensis* (Bark) plant

Ocimum sanctum leaves and bark of *Ficus* is reduced before being placed in the desiccator.

Extraction of *Ocimum sanctum* (leaves) *and Ficus benghalensis* (Bark)

Six hundred fifty grams of "leaves/bark powder" were placed in a Soxhlet apparatus and gradually extracted using petroleum ether and ethyl acetate at 60°–80°C. Afterward, various extracts were filtered before evaporating at 50°C under reduced pressure in a vacuum evaporator. In the process of crude extraction, evaporation was followed by desiccators.

Various solvents were used to extract the bark, and the dried extract was weighed after the bark residue was removed. Table 6.1 lists a variety of extracts along with their physical properties. We can easily calculate the percentage (percent) of yields from multiple extracts by using the formula given below: Use the following formula to calculate the % yield of many extracts:

$$\%\ yield = \frac{Weig\ ht\ of\ extract\ (gms.)}{Wei\ ght\ of\ dry\ powder\ (gms.)} \times 100$$

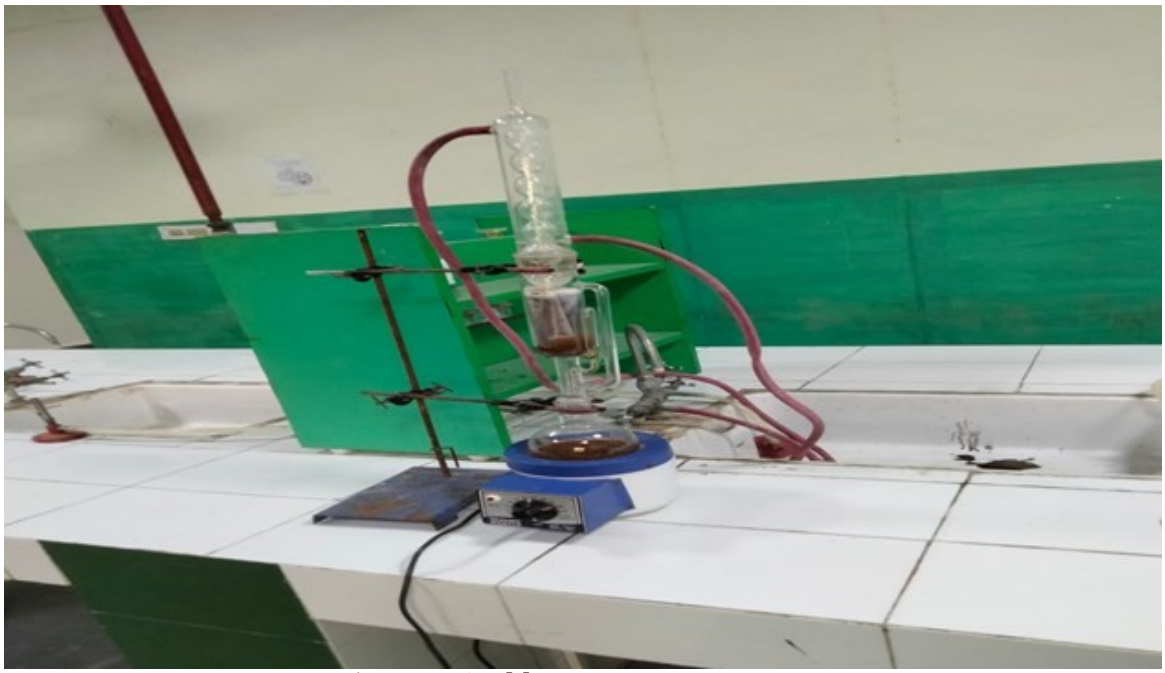

Figure 1: Soxhlet apparatus

Preliminary phytochemical screening

An extract of *Ocimum sanctum leaves* and bark of *Ficus* prepared using ethanol was examined to determine whether major phytochemical constituents were available. The phytochemical test was conducted according to standard procedures.

A variety of conventional methods were employed to conduct photochemical experiments.

Conventional methodologies were used to conduct photochemical investigations.

Phytochemical Investigations

Chemical test for carbohydrates

Using Evans &Trease (2008) test, bricks carbohydrates are monosaccharides wherein "presence of mineral acid and monosaccharide units" are released as oligosaccharides & polysaccharides hydrolyze **Evans and Trease [19].**

Fehling solution test

A Fehling solution is one of the most effective methods or techniques for decreasing blood sugar levels. According to Evans and Trease (2008), the test involves mixing two solutions simultaneously. After boiling in water baths for 10 minutes, samples of Fehling A and B solutions, each containing 1 ml, were obtained. In the case where cuprous oxide is formed, a reddish-brown precipitate occurs, which indicates that sugar is reduced.

Benedict's test

The primary goal of this test is to extract or eliminate sugars from food. Sodium hydroxide and copper sulfate are commonly used in the procedure. The primary goal of this test is to extract or eliminate sugars from food. Sodium hydroxide and copper sulfate are commonly used in the procedure. A precipitate with green color is formed mainly by successively increasing sugar concentrations caused by Cu2O production **(Evans, &Trease, 2008).** Chemical analysis of lipids is performed. The Biuret test is carried out by adding a few drops of its reagent to an aqueous protein mixture and looking for the bluish constituent.

Column chromatographic studies

The densely packed and completely packed columns are the sedentary part at the very highest of the solvent reservoir. The early solvent is widely acknowledged by way of one of the most incredible essential and beneficial non-polar solvents for growing and developing chromate, and once established, it produces the right column combination. Hexane, ethyl acetate, and other solvents are thought to be involved. In addition, when eluted types of material are observed, the boiling points of the solvents are low.

A column's composition was determined to separate chemical extracts from methanolic extracts. "Silica gel at a mesh size of 110-210, was found to be best suitable for column packings." Filling the column with slurry is the main objective of this procedure. Making the slurry mainly required chloroform. In order to lessen surface vibration throughout consecutive loading, the top end of model was sporadically enclosed with a circle made up of filter paper. Above 2.5cm, solvent level was maintained. Using constant input from the solvent, we could set rate at which the reservoir would fill, andit was also filled to the brim with the solvent in the constant contribution reservoir. Pouring the semisolid methanolic extraction into the entire column was done with a funnel. As the elutes were collected in flasks, they were gathered drop by drop. This method was developed primarily for recognizing compounds eluted from different solvent systems. After the elution process, the whole column was eluted with methanol.

Table 1: Column chromatography of ethyl acetate extract

Fraction number	Solvent system	Ratios of solvent used	Amount of fraction collected
1	N-hexane	100%	100 m l
2	N-hexane: ethyl acetate	90:10	100 m l
3	N-hexane: ethyl acetate	80:20	100 m l
4	N-hexane: ethyl acetate	70:30	100 m l
5	N-hexane: ethyl acetate	60:40	100 m l
6	N- hexane: ethyl acetate	50:50	100 m l

Table 2: Acute Toxicity Studies of Extract

"OECD guidelines and standards assessed the degree of oral toxicity." It will

S.NO.	Treatment	Dose	Weight of the animal in gram		Signs of toxiciy
			before	after	
1.	*Ficus benghalensis* Linn. Extract	250 mg/kg	192gm	193gm	No signs of toxicity
2.	*Ficus benghalensis* Linn. Extract	500 mg/kg	200gm	201gm	No signs of toxicity
3.	*Ficus benghalensis* Linn. Extract	1000 mg/kg	190gm	192gm	No signs of toxicity
4.	*Ficus benghalensis* Linn. Extract	2000 mg/kg	201gm	200gm	No signs of toxicity
1	*Ocimum sanctum* leaves extract	250 mg/kg	192gm	193gm	No signs of toxicity
2	*Ocimum sanctum* leaves extract	500 mg/kg	200gm	201gm	No signs of toxicity
3	*Ocimum sanctum* leaves extract	1000 mg/kg	190gm	192gm	No signs of toxicity
4	*Ocimum sanctum* leaves extract	2000 mg/kg	201gm	200gm	No signs of toxicity

predominantly be determined by the OECD dosage method whether there is a certain amount of oral toxicity.

The findings show that rats were not much injured or killed when exposed to ethanol extracts at a 2000mg/kg dose.

Due to this, future experiments with "doses of 250mg/kg, 500mg/kg, and 1000mg/kg" will be conducted.

Experimental Setup for Experiment

Pylorus Ligation induced ulcer model:

"Five different group of 6 rats in each were formed. Animals in group I received 1% CMC suspension in distilled water for five days. Ranitidine was only administered to the animals in Group II for five days. Groups III, IV, and V received injections of an ethanolic extract of *Ficus benghalensis* and*Ocimum sanctum* (leaves)at doses of 250.0, 500.0, and 100.0 mg / kg b.w. Animals went through nocturnal fasting procedure on the sixth day. Animals were subsequently given anesthesia, and their abdominals were slit and opened.

A thread was passed from the rats' ligation and ligated 5-6 hours after obtaining gastric values and reporting the volume. The gastric contents can be recorded and utilized to evaluate and calculate biochemical and physical parameters in general Lakshmi et al. [32].

Because Lakshmi et al. (2010) calculated the quantity of ULCERS, it was believed that the score would be more significant. The index value of ulcers may be intended using the formula.

Determining summed up acidity:

"After centrifugation, 9mL of distilled water was used to dilute 1mL of stomach juice into 100mL conical flasks. Topfer's reagent was used indicator as the titrated solution was against 00.01N NaOH. Color of the solution soon varied from reddish to yellowish orange after that. Adding drops of phenolphthalein to the solution till the time color of the solution turned to pink or red, titration procedure was repeated indefinitely to ascertain the amount of acidity in the solution. The amount of NaOH used was noted, and the total acidity was calculated. Milliequivalents of acid quantify the amount of acid in one liter of water.

Indomethacin-induced ulcer:

Six groups of six albino rats each were created from the 36 total. The animals in group I was given nothing except distilled water. Animals in group II were administered indomethacin (30 mg/kg) and slaughtered four hours later. In group III, rats were treated with ranitidine (50mg/kg).

Groups IV, V, and VI were treated using an ethanolic extract of *Ficus benghalensis* and *Ocimum sanctum* (leaves) with 250mg, 500mg, and 1000mg/kg, respectively. Four hours after indomethacin administration, the reference drug and the *Ficus benghalensis* and *Ocimum sanctum* (leaves) extract were administered for 21 consecutive days.

Results and Discussion

It is easily disclosed or revealed with the proper use of ethanol extraction, demonstrating the occupancy of a simple matter.

As per the formula of % yields to calculate & various, the yield of extract formula is mentioned.

Table 3: Physical nature and percentage yield of various *Ficus benghalensis* Linn bark extracts

Extract (s)	Physical nature & Colour (s)	% of Yield
Petroleum Ether	Palish yellow	6.580
Ethanol	Dark Brownish	21.10

Table 4: Physical nature and percentage yield of various *Ocimum sanctum* leaves extract

Extract (s)	Physical nature Colour (s)	% of Yield
Petroleum Ether	Palish yellow	**13.99 %**
Ethanol	Dark Green	**28.83%**

In order to conduct a phytochemical investigation on *Ficus benghalensis* Linn, extracts of ethanol's and ethers of petroleum were applied.

Table 5: Phytochemical Screening

Plant constituent	Extract	
Test/ Reagent used	**Petroleum ether**	**Ethanolic**
Alkaloids		
Hager's reagent	-	+
Mayer's reagent	-	+
Dragendorff's reagent	-	+
Wagner's reagent	-	+
Phenolic compounds and Tannins		
Ferric Chloride solution	-	+
Flavonoids		
Lead acetate test	-	+
Sodium hydroxide test	-	+
Ferric chloride	-	+
Shinoda test	-	+
Carbohydrates	+	+
Molish's test	+	+
Glycosides		
Legal's test	-	+
Raymond test	-	+
Sterol	-	
Test + conc^{n} H_2SO_4	+	+
Salkowski test	+	+

Note: "+" represents present "-" represents absent

In most cases, the photochemical tests used standard methods for quantifying the contents of the samples. In the ethanolic extract, carbohydrates & steroids were presented. The petroleum ether extract was presented: alkaloids, tannins, flavonoids, carbohydrates, glycosides, and sterols.

Conclusion

Although gastric ulcers tend to be a common condition where probably anyone can get it, they are the significant contributor to several other disorders. Stomach acid and secretions exposed to the air induce peptic ulcers. The current study demonstrates that ethanolic acids have powerful anti-ulcer activities. In rats, gastric ulceration was caused. When the data were examined, it was shown that ranitidine extracts and plant extracts had similar ulcer-inducing effects.

"According to researchers at the University of Saskatchewan, an ethanol extract from *Ficus benghalensis* bark and *Ocimum sanctum* leaves has antiulcer properties in rats. In both research models *Ficus benghalensis* bark and *Ocimum sanctum* leaves significantly reduced ulcer formation."

A distilled water suspension of CMC at a concentration of 1% was given to Group I animals. A 5-day course of ranitidine was given only to animals in Group II. The ethanolic removal of *Ficus benghalensis* bark and *Ocimum sanctum* leaves was administered at "250.0 mg/ kg, 500mg/kg, and 100 mg/kg. in between for groups III, IV, and V." Animals go through the process of nocturnal fasting on the sixth day of the fast. The animals were given anesthesia, and their abdomens were sliced and opened. To collect gastric values and measure volume, a thread was inserted from the gastrostomy tube and then ligated afterward for 4 to 5 hours of ligation of the rats. "The evaluation and computation, considering biochemical and physical parameters, were completed using the gastrointestinal contents."

Ethanolic extracts in *Ficus benghalensis* bark and *Ocimum sanctum* leaves was given to rats to explain and describe a few characteristics of gastroprotective compounds, and this study also contributed to the establishment of a precise understanding of the function of gastroprotective compounds.

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Cite this article as:
Ram N.K. and Dubey V. (2024). Anti-ulcer Activity of *Ocimum sanctum* leaves and *Ficus benghalensis* Linn. Stem bark Ethanolic Extract in Rats. *Int. J. of Pharm. & Life Sci.*, 15(7): 39-44.

Source of Support: Nil
Conflict of Interest: Not declared
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