

Ulcer Healing Potential of the Aqueous Extract of *Malvastrum tricuspidate* Eliminating Toxicity

Vishal N. Kushare^{*1}, Sagar V. Ghotekar², Manmeet S. Mandloi³

¹Department of Pharmaceutics, Maratha Vidya Prasarak Samaja's Institute of Pharmaceutical Sciences, Adgaon, Nashik-422003, Maharashtra, India

²Department of Pharmaceutics, SSDJ College of Pharmacy, Chandwad, Nashik-423 101, Maharashtra, India

³Department of Pharmacy, B. R. Nahata College of Pharmacy (BRNCP), RGPV Bhopal University, , Mandsaur, Bhopal-458001, Madhya Pradesh, India

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ABSTRACT

Ulcers are one of the dreadful and technically known as Peptic Ulcer Disease (PU Disease). Around 10million people around the world are suffering from the disease, and the majority of the people are about 20-50 years of age. This is not a dangerous disease on its own. Still, the ulcers are responsible for the resulting in other diseases like indigestion stomach pain etc. there are various reasons for the causation of ulcer. They are excessive use of pain killers and anti-inflammatory drugs, malnutrition, and unhealthy food habits, stress and steroids. Almost half of the world population relies on herbs for the treatment, and the major sources of the chemical leads that treat diseases are in the medicinal plants only. Many plants have been investigated and reported for their potential antiulcer benefits and are published too for that. The plant parts of *Malvastrum tricuspidatum* were extracted using distilled water and were investigated for the antiulcer activity in 3 doses like 100,200 and 400mg. The Extract at a higher dose showed better activity than other lower doses. The activity was compared with the standard drug and showed a significantly better activity that the standard and other doses of Extract too.



*Corresponding Author

Name: Vishal N. Kushare
Phone: +91-7744889098
Email: vishalkushare7@gmail.com

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INTRODUCTION

Ulcers are one of the dreadful and technically known as Peptic Ulcer Disease (PU Disease). Around 10million people around the world are suffering from the disease, and the majority of the people are about

20-50 years of age [1]. This is not a dangerous disease on its own. Still, the ulcers are responsible for the resulting in other diseases like indigestion stomach pain etc. there are various reasons for the causation of ulcer. They are excessive use of pain killers and anti-inflammatory drugs, malnutrition, and unhealthy food habits, stress and steroids [2].

Ulcers are caused by various mechanisms like increase in the gastric acid secretion, an increase in the prostaglandin synthesis, an increase in the H pylori infection etc. all these assists in the growth of ulcers. That is why the primary mechanism of the ulcer treating drugs is the reduction in the gastric acid content and covering the mucosal layer from direct contact with acid [3].

Out of all the synthetic drugs, some drugs treat ulcers very effectively. The chronic administration of these drugs is known to cause other compli-

cations and side effects [4]. Medicinal plants are known to treat diseases in human beings ever since human evolution is started. Almost half of the world population relies on herbs for the treatment and the major sources of the chemical leads that treat diseases are in the medicinal plants only [5]. Many plants have been investigated and reported for their potential antiulcer benefits and are published too for that [6] [7].

This work focus on the plant ethanol extract of *Malvastrum tricuspidatum* was found to have antiulcer properties already and considering that the Ethanol as a solvent is toxic and the water is used as a solvent for extraction [8]. It was then tested for the antiulcer activity in Ethanol-induced ulcers. Table 1

Experiment procedure

Rat grouping and maintenance

The experimental animals that are used for this research were rats of albino Wistar strains. The animals were procured from the supplier in the city, and they were kept in the laboratory conditions in the light tonight cycle of 12 hrs -12 hrs. They are maintained in the cages with an allowance of free food pellets and water. All the experiments on animals are performed by following the CPCSEA guidelines.

Extraction

The plant parts were collected from the nearby area, and they are dried under shade for about 5days under controlled temperature and humidity. After the parts dried and brittle, they were collected and powdered using a blender. The powder is finely made and used for the extraction process in maceration [9]. The plant powder was macerated with 100ml of distilled water in a beaker for four days with occasional stirring and shaking to ensure the solvent distribution into the drug. The macerate was compressed and filtered using a filter paper. This was then evaporated and dried to get a dried extract

Toxicity study of Extract

The experimental animals used in the test was investigated for the oral toxicity, and the dose of a drug used was 2000mg in a kg of the rat. The rats were examined for some signs of the toxicity. The experiments were continued to 14 days, and the rats showed no signs of toxicity and abnormal behaviour like scratching, biting etc. so the Extract was said as safe at the dose of 2g, and so the effective dose was fixed as 200mg.

Antiulcer Screening method

The ulcer protection potential of the extracts was measured in 3 doses as 100, 200 and 400mg/kg of

Extract. In this experiment, Ethanol is used as an inducing agent [10]. The animals were grouped, and the experiment proceeded as follows.

Batch-I received the normal saline at the dose of the 1.6ml/kg of the weight of the animal with a concentration of 0.9%.

Batch-II received the normal saline at the dose of the 1.6ml/kg of the weight of the animal with a concentration of 0.9% and also the induction agent that is Ethanol.

Batch-III received Extract at a dose of the 100mg in the oral route per kg of the animal weight.

Batch IV received Extract at a dose of the 200mg in the oral route per kg of the animal weight.

Batch V received Extract at a dose of the 400mg in the oral route per kg of the animal weight.

Batch VI received a synthetic standard, Pantoprazole at a dose of the 20mg in the oral route per kg of the animal weight

The batches from II-VI were administered with Ethanol at the dose of 20ml to a kg BW of rat [11]. The experiments were continued for 14 days, and the last day animals were sacrificed, and then the stomach is opened. The stomachs are collected, and the gastric contents were collected by opening it in the greater curve. The gastric contents were measured, and the pH was also appropriately measured using a digital pH meter. Ulcer indices were calculated and tabulated by the below formula.

Ulcer index (UI) = $\frac{\text{Ulcer surface of the control group} - \text{Ulcer surface area of treated group}}{\text{Ulcer surface of the control group}} \times 100$

RESULTS AND DISCUSSION

With the induction of the Ethanol in Batch II, the ulcers were induced rapidly, and the ulcer indices were also high compared to other treatment batches and even the normal batch. The aqueous extracts that were tested and the antiulcer activity was measured by taking into consideration the ulcer index and the percentage inhibition. Out of all the batches, Batch V showed an enormous antiulcer potential that other batches which had low doses like 100 and 200. The Batches showed an antiulcer property but not better when compared to the higher dose of 600mg dose. The standard drug compared with the highest dose of Extract showed a lesser activity were in the extracts lowered the gastric content volume, and the pH was also elevated. This shows the plant extract showed better antiulcer activity in the Ethanol-induced model.

Table 1: Ulcer protective effect of the Aqueous Extract of the plant, *Malvastrum tricuspidatum*

Slno.	Batches	Ulcers Index-UI	%inhibition	Gastric content Volume-ml/g	Gastric content pH
I	Saline control	NA	NA	0.97± 0.013	3.15 ± 0.09
II	Induced batch	14.32± 5.29	No inhibition	6.51 ± 0.94	4.2± 0.73
III	Plant extract @100mg/kg	10.27± 3.41	29.30	4.69± 0.82	5.14± 1.04
IV	Plant extract @200mg/kg	8.61 ± 4.12	47.64	3.18± 0.51	4.91 ± 0.87
V	Plant extract @400mg/kg	6.20± 3.49	63.50	4.25± 0.78	5.04± 0.90
VI	Pantop-20 mg/kg	5.11±1.08	80.36	3.61±0.67	4.72±1.09

Ethanol exhibits the ulcer induction by a mechanism where it generated the free radicals, and these free radicals interfere in the cell membrane consistency. The destroys the integrity of the gastric mucosal membrane. It leads to the formation of ulcers. The plant extract showed a productive antiulcer activity in the ethanol model means it shows a better antioxidant activity. The potency of the Extract might be due to the presence of various chemical constituents and antioxidant leads [12].

CONCLUSIONS

The plant parts of *Malvastrum tricuspidatum* were extracted using distilled water and were investigated for the antiulcer activity in 3 doses like 100,200 and 400mg. The Extract at a higher dose showed better activity than other lower doses. The activity was compared with the standard drug and showed a significantly better activity that the standard and other doses of Extract too.

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Conflict of Interest

Authors declared no conflict of interest.

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ABOUT AUTHORS



Vishal N. Kushare

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