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Evaluation of anti-ulcer activity of leaves and fruits extracts of *moringa oleifera* lam. Using cysteamine induced duodenal ulcers

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Abstract
Moringa oleifera Lam. (Moringa), family Moringacea have demonstrated the beneficial effects in humans. It has been recognized as containing a great number of bioactive compounds *viz.*, vitamins, carotenoids, polyphenols, phenolic acids, flavonoids, alkaloids, glucosinolates, isothiocyanates, tannins and saponins. The present investigation was carried out to investigate anti-ulcer activity of various extract of the plant using Cysteamine induced duodenal ulcers.

Keywords: moringa oleifera, anti-ulcer activity, cysteamine induced

Introduction
Moringa, a native plant from Africa and Asia, and the most widely cultivated species in Northwestern India, is the sole genus in the family Moringaceae. It comprises 13 species from tropical and subtropical climates, ranging in size from tiny herbs to massive trees. The most widely cultivated species is *Moringa Oleifera* (MO).

The most used parts of the plant are the leaves, which are rich in vitamins, carotenoids, polyphenols, phenolic acids, flavonoids, alkaloids, glucosinolates, isothiocyanates, tannins and saponins. The high number of bioactive compounds might explain the pharmacological properties of MO leaves. Many studies, *in vitro* and *in vivo,* have confirmed these pharmacological properties.

The leaves of MO are mostly used for medicinal purposes as well as for human nutrition, since they are rich in antioxidants and other nutrients, which are commonly deficient in people living in undeveloped countries. MO leaves have been used for the treatment of various diseases from malaria and typhoid fever to hypertension and diabetes.

The roots, bark, gum, leaf, fruit (pods), flowers, seed, and seed oil of MO are reported to have various biological activities, including protection against gastric ulcers, antidiabetic, hypotensive and anti-inflammatory effects [1-5].

Peptic ulcers are PU manifested as a non-fatal disease, majorly represented by periodic symptoms of epigastric pain, which are often relieved by food or alkali, besides to trigger much discomfort to patients, disrupting their daily routines and also causing mental agony.

Studies have shown that peptic ulcer disease (PUD) occurs because of an imbalance between aggressive injurious (e.g., pepsin, HCl) and defensive mucosa-protective factors (e.g., prostaglandins, mucus and bicarbonate barrier and adequate blood flow).

A special emphasis was given on plant products safety and security, in order to trigger the interest in deepening skills on this matter and to ensure an effective managing competence for health-related systems [6-7].

Material and Methods
Collection of Plant Material and Extraction Procedure
Moringa oleifera Lam were collected from the botanical garden of Ram Krishna Dharmarth Foundation University Bhopal Madhya Pradesh between 28/01/2017 to 25/09/2017. Plant was authenticated by the Head of Department of botany Dr. Zia Ul Hasan Professor of Safia College of Science Bhopal. Plant authentication no. is 346/Bot/Safia/2017 the date14/10/2017.

Extraction of Leaves and Fruits
The leaves and fruits were shade dried and reduced to coarse powder in a mechanical grinder and passed through sieve No. 40. The powdered material obtained was then subjected to successive extraction in batches using petroleum ether, chloroform, and acetone and methanol solvents in a Soxhelet extractor. The different extracts obtained were evaporated in rotary evaporator to get a semisolid mass. The extracts thus obtained were subjected to phytochemical analysis.

Experimental Animal
Animals
Male albino Wistar rats weighing between 200-250 gm were used. The experiment protocol was approved by the Institutional Animal Ethics Committee (IAEC), Vedica College of B Pharmacy, RKDF University, and Bhopal. The Animals were housed and maintained in animal house of the institute, Animals were kept in cages while maintaining a temperature 26$\pm$2°***C*** with 12 hours: 12 hours' dark and light cycles.

They were fed standard diet and water *ad libitum* given. Animals that were subjected for administration of standard drugs used and selected extracts, were fasted for 18 hours before administration of drugs to the experimental animals. All animals were maintained under standard conditions in an animal house approved by Committee for the Purpose of Control, and Supervision on Experiments on Animals (CPCSEA).

Acute Toxicity Study

The acute oral toxicity study was performed according to the OECD guidelines (Organisation for Economic Co-operation and Development) (Office of prevention, pesticide and toxic substance) Up and Down procedure (Health Effect Test Guideline 2004). The different extracts were suspended using 0.5% sodium carboxy methylcellulose and were administered orally. The concentration was adjusted in such a way that it did not exceed 1ml/kg b/w of the animal.

Cysteamine Induced Duodenal Ulcers

Duodenal ulcers were induced by administering cysteamine hydrochloride (400mg/kg p.o) twice at an interval of four hours. Extracts (500mg/kg p.o.) or ranitidine (50mg/kg p.o.) were administered 30 minutes prior to each dose of cysteamine hydrochloride. After 24 hours, all the animals were sacrificed by over dose of ether anesthesia and the duodena were excised carefully and cut opened along the antimesentric side. The duodenal ulcer area, ulcer score and ulcer index were determined [8].

The ulcers were given scores based on their intensity as follows

0 = no ulcer, 1 = superficial mucosal erosion, 2 = deep ulcer or transmural necrosis,
3 = perforated or penetrated ulcer.

Statistical Analysis

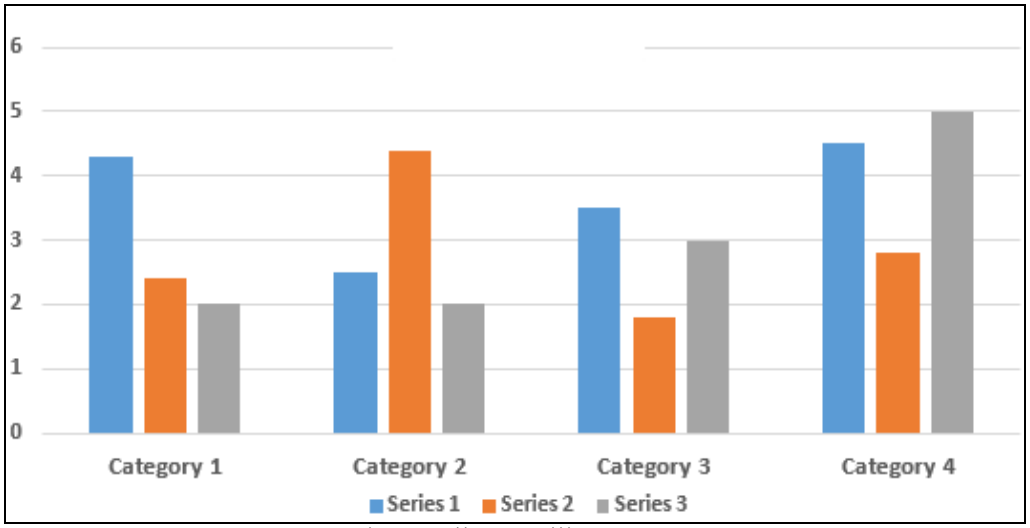
The statistical significance was assessed using one-way analysis of variance (ANOVA) followed by Dunnet comparison test. For comparing nonparametric ulcer scores, ANOVA followed by non-parametric Dunn posttest was used. The values are expressed as mean ±SEM and $p<0.05$ was considered significant.

Results and Discussion

The acetone extract of *Moringa oleifera* showed a highly significant reduction in ulcer area when compared to control ($p<0.01$).The methanolic extracts of *Moringa oleifera* and ranitidine showed a significant reduction in ulcer area when compared to that of control ($p<0.05$). The petroleum ether leaf extract did not show any significant reduction in ulcer area. None of the treatments produced any significant effect on ulcer score and ulcer index (Table: 1) the ulcer was developed in the anti-mesenteric side of the duodenum.

Table 1: Effect of *Moringa oleifera* different extracts on ulcer area, ulcer score and ulcer index in cysteamine induced duodenal ulcers

Treatment	Ulcer area	Ulcer score	Ulcer Index
Control	5.49±0.358	2.1±0.3722	7.2
Ranitidine 2.8±0.800*	1.2±0.2434	2.4±0.2054	4.2
Petroleum ether flower extract	3.72±0.723	2.3±0.4042	5.3
Acetone flower extract	2.00±0.247**	1.2±0.3017	4.3
Methanol flower extract	2.90±0.711*	1.4±0.2205	5.1
Chloroform flower extract	2.73±0.622	1.2±0.2031	4.8
Petroleum ether fruits extract	1.00±0.258**	1.3±0.3204	4.2
Acetone fruits extract	2.14±0.623*	1.2±0.1127	4.2
Methanol fruits extract	2.42±0.734	2.4±0.4184	5.9
Chloroform fruits extract	1.100±0.457**	1.4±0.4203	4.5
Petroleum ether seeds extract	1.31±0.422*	1.2±0.1104	4.3
Acetone seeds extract	2.34±0.532	1.3±0.1023	4.4
Methanol seeds extract	1.01±0.345**	1.4±0.2103	4.3
Chloroform seeds extract	1.12±0.522*	1.3±0.1244	4.4
Petroleum ether leaves extract	2.33±0.642	1.3±0.3155	5.6
Acetone leaves extract	3.52±0.643	2.3±0.2083	5.9
Methanol leaves extract	1.201±0.348**	1.3±0.6302	4.4
Chloroform leaves extract	2.13±0.531*	1.2±0.1232	4.1



All values are mean ± SEM, n = 5-6. *$p<0.05$, **$p<0.01$, ***$p<0.001$ when compared to control group

Fig 1

Conclusion

Cysteamine induced duodenal ulcer in rat is the widely used model of peptic ulcer disease. The ulcer induced by this model resembles histo pathologically and patho physiologically to that of the duodenal ulcer in humans. The agents having cytoprotective and antisecretory effect are effective in this model. Cysteamine hydrochloride inhibits the alkaline mucus secretion from the Brunner's glands in the proximal duodenum and stimulates gastric acid secretion rate. Gastric emptying is also delayed and serum gastrin concentration is increased. The acetone and methanolic flower extracts of *Moringa oleifera* were effective in reducing the ulcer area. This suggests the cytoprotective effect of *Moringa oleifera* flower extract.

In cysteamine induced duodenal ulcer the acetone, methanolic differents extracts of *Moringa oleifera* (500mg/kg.p.o) and ranitidine (50mg/kg p.o) showed a significant reduction in the ulcer area. The acetone extract was found to be more potent when compared to other extracts. This suggests the cytoprotective effect of *Moringa oleifera* extract.

References

1. Padayachee B, Baijnath H. An overview of the medicinal importance of Moringaceae. J. Med. Plants Res. 2012; 6:5831-5839.
2. Sivasankari B, Anandharaj M, Gunasekaran P. An ethnobotanical study of indigenous knowledge on medicinal plants used by the village peoples of Thoppampatti, Dindigul district, Tamilnadu, India. J. Ethnopharmacol. 2014; 153:408-423.
3. Pal SK, Mukherjee PK, Saha BP. Studies on the antiulcer activity of Moringa oleifera leaf extract on gastric ulcer models in rats. Phytother. Res. 1995; 9:463-465.
4. Oyedepo TA, Babarinde SO, Ajayeoba TA. Evaluation of the antihyperlipidemic effect of aqueous leaves extract of Moringa oleifera in alloxan induced diabetic rats. Int. J. Biochem. Res. Rev. 2013; 3:162-170.
5. Faizi S, Siddiqui B, Saleem R, Aftab K, Shaheen F, Gilani A, *et al.* Hypotensive constituents from the pods of Moringa oleifera. Planta Med. 1998; 64:225-228.
6. Tytgat G. Etiopathogenetic principles and peptic ulcer disease classification. Digest. Dis. 2011; 29:454-458.
7. Padayachee B, Baijnath H. An overview of the medicinal importance of Moringaceae. J. Med. Plants Res. 2012; 6:5831-5839.
8. Szabo S. Animal model for human disease: Duodenal ulcer disease. Amer J Pathol. 1978; 73:273-276.