ISSN 0975-6299 Vol 2/Issue 1/ Jan-Mar 2011

International Journal of Pharma and Bio Sciences

RESEARCH ARTICLE

PHARMACOLOGY

ANTI-ULCER ACTIVITY OF AQUEOUS EXTRACT OF MURRAYA KOENIGII IN ALBINO RATS

Corresponding Author

DINESH KUMAR PATIDAR

Department of Pharmacology Dr. Shri R.M.S. Institute of Science & Technology, College of Pharmacy, Bhanpura, Dist. Mandsaur (M.P.) 458775, India

ABSRACT

The anti-ulcer effect of aqueous extract Murraya Koenigii was studied in Pylorus ligation and NSAIDs induced ulcer model in albino rats. The extract at dose of 200,400 mg/kg produced significant inhibition of gastric lesion induced by NSAIDs and Pylorus ligation induced ulcer. The extract reduced ulcerative lesion, gastric volume, free and total acidity but raised the P^H of gastric juice in Pylorus ligation model. The result obtained suggesting that extract possesses significant anti-ulcer activity.

KEYWORDS

Murraya Koenigii, Anti-ulcer, Pylorus ligation, NSAIDs ulceration, Ulcer index

INTRODUCTION

Peptic ulcer is one of the most common gastrointestinal disease.[1] The exact Causes of peptic ulcer disease is not known but it may be result from an imbalance between acid-pepsin Secretion and mucosal defence factors.[2] Peptic ulcer disease occurs mainly due to consumption of NSAIDs, infection by H. pylori, stress or due to pathological condition such as zollinger – Ellison Syndrome.[3]

Murraya Koenigii commonly known as 'meethi Neem' in Hindi, belong to family Rataceae, is an aromatic decidous shrub or a small tree up to 6 m in height found throughout India.[4] It commonly occurs in foothills of Himalaya, Assam, Skim, Kereala, Tamil Naidu, Andra Pradesh, Maharastra.[5] On phytochemical investigation researcher claimed that leave of Murraya Koenigii found to contain alkaloids, volatile oil , Gycozoline, Xanthotoxine and sesquiterpione[6].The leaf has been found to show antioxidant activity,[7], Hypoglycemic activity[8], antibacterial activity[9], anti- dysentery[10] and also act as a hepetoprotective.[11]

MATERIAL AND METHOD

Plant material

The plants Murraya Koenigii were obtained from medicinal garden of Shri Dhairya prabha devi sojatia ayurvedic medical college, neemthur, Bhanpura Dist, Mandsaur and authenticated by Dr. Rakesh Gupta, Department of Dravyaguna, Shri Dhairya prabha devi sojatia ayurvedic medical college, neemthur, Bhanpura.Voucher specimen was deposited to herbarium of Shri Dhairya Prabha devi sojatia ayurvedic medical college, neemthur, Bhanpura vide Specimen no. SDPS/10/PS/175 After authentication, fresh leaves collected in bulk from plants, washed shade dried and then milled to a coarse powder by a mechanical grinder.

Preparation of Extract

The powder dried leaves were packed in to soxhlet column and extract with distilled water. The extract was filter through a Whatman filter paper no.1and concentrated under reduced pressure (yield of extract was 7.70% with respect to dry material). Just prior to use, the substance was dissolved in physiological saline solution.

Experimental Animal

Fortyeight adult healthy female Wister albino rats of weighting between 160-200gm were used for the study. The animals were house in standard condition (temperature 240±2 with 50-60% relative humidity and a 12 hours light dark cycle). The entire animal had free access to water and normal diet (Hindustan lever). The study was approved by Institutional Animal Ethical Committee (IAEC) and was in accordance with the guideline of the Committee for the Purpose of Control and Supervision of Experimental Animal (CPCSEA).

EVALVATION OF ANTI -ULCER ACTIVITY

Two animal models (NSAIDs & Pyloric ligation) were employed to evaluate the Anti-ulcer activity of Murraya Koenigii leaf extract.

NSAIDs – induce ulcer

Healthy female Wister albino rats of weighting between 160-200gm were taken for the studies. The animal were divided in to four groups (each contain 6 animal) us follow

Group – I (Control) : Distilled water x 6
Group – II (Standard) : Ranitidine x 6
Group – III : Extract (200mg/kg) x 6
Group – IV : Extract (400mg/kg) x 6

The animal in all the groups were kept for 24 h. fasting after that animal of all groups' received diclofenac sodium (NSAIDs, 20mg/kg). The oral feeding of water and diclofenac sodium was continued for 3 days, the animal of II, III and IV were administered with ranitidine (13.5mg/kg), leaf extract (200mg/kg), leaf extract (400mg/kg) respectively after 3 h. of diclofenac sodium administration. On 4th day the animals were sacrificed, stomach were removed and cut along the greater curvature to measure the ulcer index.[12]

Pyloric ligation – induced ulcer

Animal are divided in to four groups, each contain 6 animals (mention in above method). Group I having pyloric ligation and received distilled water orally. Groups II received ranitidine (13.5mg/kg) as reference drug for ulcer protective study. Group III and IV received aqueous extract of Murraya Koenigii in a dose of 200 and 400mg/kg. After 45 min of aqueous extract of Murraya Koenigii and ranitidine treatment, pyloric ligation was be done by ligation the pyloric end of stomach of rats of respective groups under ether anesthesia. Animal were allowed to recover and stabilize in individual case and were deprived of water during post operative surgery. After 4 h. of surgery, rats were sacrificed and ulcer score was done. Gastric juice was collected and gastric secretions studied were performed. [13]

Scoring of ulcer [14]
0 = Normal coloured stomach
0.5 = Red colouration
1 = Spot ulcer
1.5 = Haemorrhagic streaks
2 = Ulcers ≥ 3 but ≤ 5
3 = Ulcers >5

Calculation of ulcer Index [15]**:**
$U_I = U_N + U_S + U_P \times 10^{-1}$
U_I = Ulcer Index
U_N = Average of number of ulcer per animal
U_S = Average of severity score
U_P = Percentage of animal with ulcer

Determination of acidity[13]

$$\text{Acidity} = \frac{\text{Volume of NaOH} \times \text{Normality of NaOH} \times 100}{0.1} \text{ mEq/L}$$

Determination of percentage protection[16]

$$\%\text{Protection} = \frac{\text{Control mean ulcer index} - \text{Test mean ulcer index}}{\text{Control mean ulcer index}} \times 100$$

RESULT AND DISCUSSION

In the present study, aqueous leaf extract of Murraya Koenigii was evaluated for its anti-ulcer activity against NSAIDs and pylorus ligation induced gastric ulcer model. The results of study are tabulated in Table-I and Table –II.

Table I

Effect of aqueous leaf extract of Murraya Koenigii on NSAIDs – induced ulcer in rats

Group	Dose (mg/kg)	Ulcer Index	% Protection
Control	20	4.65±0.41	- -
Omeprazole	13.5	1.02± .26*	78.06
Aqueous extract	200	1.92±0.45*	58.71
Aqueous extract	400	1.15±0.30*	75.27

Values are mean ± S.E.M. (n = 6), Significant as compared to control P < 0.001*

Table II

Effect of aqueous leaf extract of Murraya Koenigii on Pylorus ligation – induced ulcer in rats

Group	Dose (mg/kg)	Ulcer Index	% Protection	Free acidity (mEq/L)	Total acidity (mEq/L)	Volume of gastric juice (ml)	P^H of Gastric juice
Control	- -	0.17±0.005	- -	40.5±2.88	50.4±4.43	4.52±0.61	2.0±0.08
Omeprazole	13.5	0.05±0.02**	70.59	5.01±1.07**	13.1±1.06**	2.04±0.13**	3.68±0.20**
Aqueous extract	200	0.09±0.01**	47.06	22.0±1.680**	37.0±2.77*	3.15±0.07*	2.85±0.10**
Aqueous extract	400	0.07±0.005**	58.82	18.022±1.68**	20.0±2.15**	2.98±0.1*	2.20±0.08**

Values are mean ± S.E.M. (n = 6), P < 0.01 P** < 0.05 when compared to control group*

In NSAIDs induce ulcer model the plant extract at dose of 200 and 400 mg/kg showed significant gastro protective activity 58.71% and 75.27% compared with standard drug omeprazole showed 78.06% (Table-I)

In ligation induced gastric ulcer. Both doses of Murraya Koenigii extract showed significant reduction in ulcer index, free acidity, total acidity and gastric volume but raised PH of gastric Juice as compared to the control groups. It was showing protection index 47.06% and 58.82% at a dose of 200 and 400 mg/kg respectively compared with standard drugs omeprazole showed 70.59% (Table-II)

To conclude, the aqueous extract of Murraya Koenigii possesses anti-ulcer activity. The aqueous extract of Murraya Koenigii produced both antisecertory and cytoprotective effect.

ACKNOWLEDGEMENT

The authors are thankful to the principal and management of College of Pharmacy, Dr. Shri R.M.S. Institute of Science & Technology, Bhanpura, Dist. Mandsaur (M.P.) 458775, India for providing necessary facilities to carry out the present research work.

REFERENCES

1. P.C.Dandiya, S.K. Kulkarni. Introduction to Pharmacology. Vallabh Prakashan New Delhi, 2005. pp. 247
2. Padmaja Udaykumar. Textbook of medical Pharmacology, CBS publishers, New Delhi, 2005 pp. 317.
3. Mohammed A., Ravi Kumar J., Santosh H.Y.and Nagashruthi M.H. Antiulcer activity of anisochilus carnosus leaf extracts in pylorus ligation rats. Indian Drugs 45 (12): 979. (2008).
4. Iyer D. and Uma D.P. Effect of Murraya Koenigii (L) on radiation induced rate of lipid peroxidation in Swiss albino mice. Indian Drugs 46 (2): 160 (2009).

5. S.K.Bhattacharjee.Hand Book of Medicinal Plant. Pointer publishers, Jaipur, 2001, pp. 230.
6. M.S. Pande, S.P.B.N Gupta, A. Pathak. Hepatoprotective Activity of Murraya Koenigii Linn Bark. Journal of Herbal Medicine and Toxicology 3(1): 69-71 (2009).
7. Tachibana, Y., Kikuzaki, H., Laic, N.H. and Nakatani, N. Journal of Agriculture and Food Chemistry 49(11): 5589 (2001).
8. Achyut Narayan Kesari, Rajesh Kumar Gupta and Geeta Watal. Hypoglycemic effect of Murraya Koenigii on normal and alloxan-diabetic rabbits. Journal of Ethno pharmacology 97(2): 247-251 (2005).
9. S.M.Zachariah, P. Muthumani, K. Ramaseshu. Photochemistry and Antimicrobial screening of stem bark of murraya koenigii (Linn) spreng. The Internet Journal of Pharmacology 6(2): (2009).
10. Adebajo, A.C., Ayoola, O.F., Iwalewa, E.O., Akindahunsi, A.A., Omisore, N.O., Adewunmi, C.o. and Adenowo, T.K... phytomedicine13 (4):246 (2006).
11. John wilking Einstein, Johnson.K.Mathias, Kuntal Das, I.S.R.Nidhaya and G. Sudhakar. Comparative Hepatoprotective Activity of Leaf Extracts of Murraya Koenigii from Indian Subtropics. Indian Journal of Natural Product 23(1): 13-17(2007).
12. Patil S.S., Bhide A.A. and Gorle A.M. Antiulcer activity and Ant inflammatory studies on acacia catechu. Indian Drugs 47(2):52-53(2010).
13. Raju. D., Ilango. K., Chitra. V., Ashish. K. Evaluation of Antiulcer activity of methanolic extract of Terminalia Chebula fruits in experimental rats. Journal of Pharmaceutical Sciences and research 1(3):101-107 (2009).
14. S.K. Kulkarni. Hand book of experimental Pharmacology, Vallabh Prakashan New Delhi, 2002 pp. 149-150.
15. H.Gerhard Vogel. Drug Discovery and Evaluation, Springer-Verlag Berlin Heidelberg, New Your 2002 pp. 868.
16. Hojage M.G., Hriprassanna R.C., Patil K.S., Matha Pati. S., Wadkar G. and Rao K.P. Antiulcer effect of alcoholic extracts of Murus Alba Linn. Leaves in rodents. Indian Drugs 47(6): 64-68 (2010