

ANTIULCER ACTIVITY OF AEGLE MARMELOS Linn**J. ILAVARASAN. R¹, MONIDEEN.S² AND VIJAYALAKSHMI. M³.**

1. C.L. Baid Metha college of pharmacy, Chennai-600 096.
2. Adhiparasakthi College of Pharmacy, Melmaruvathur – 603 319.
3. Department of Biochemisry, University of Madras, Guindy Campus, Chennai – 600 032.

Received: 13.8.2001**Accepted: 10.2.2002**

ABSTRACT: *Aegle marmelos Linn is a common plant used to treat many disease Conditions in Indian traditional systems of medicine. The present study was undertaken to findout a scientific validation for the efficacy of Aegle marmelos against gastric ulcer. Aqueous extract of Aegle marmelos leaves was prepared and used for investigation. A daily does of 1 gm/kg body weight of the extract administered orally for 21 days. The volume of the gastric cretion, ulcer lesion count, pepsin content, PH, total acidity, hexose and hexosamine content were estimated. The result indicated a significant reduction in the ulcer lesion count, volume of gastric juice and acidity and increase in pH and hexosamine after treatment with extract. However the pepsin and hexose content not significantly altered. Histopathological studies were conducted to support the antiulcer study.*

INTRODUCTION

Aegel marmelos (Rutaceae) is known as Vilvam¹ in Tamil. The drug posses² astringent, digestive, laxative, antiulcer, febrifuge and antifertility activities. It is reported that Aegel marmelos posses anti-diabetic³, and used in piles⁴. In spite of its uses in ulcer no systematic studies on antiulcer activity have been reported. Hence an effort has been made to establish antiulcer activity in the leaves of Aqueous extract of Aegle marmelos.

The plant material used in this study were collected from Melmaruvathur, Tamilnadu and identified by Dr. R. Neelamegam, M.Sc., M.Phil, Ph.D., Department of Botany, Hindu college, Nagercoil.

MATERIALS AND METHODS

Male wistar rats weighing about 150-250 gm were obtained from king institute, Guindy,

Chennai, India for the study. The animals were maintained on a commercial pelleted food (Supplied by M/S Hindustan lever foods, Bangalore) and water ad libitum till the end of the experimental period.

The experimental animals were divided into three groups of six animals in each group. Group I served as control, ulcer was induced in group II rats. Rats of group III were pretreated with Aelge marmelos (1gm/kg boby weight for a period of 21 days) before induction of ulcer On 22nd day immediately after aspirin treatment, pylorous ligation⁵ was performed under ether anaesthesiaon 36 hour fasted rat. Four hours after pylorous ligation the animals were sacrificed by giving over dosage of ether. The stomachs were removed and opened along with greater curvature and the gastric lesions were observed the gastric contents collected into a small beaker centrifuged and then it

was subjected to various investigations like volume of gastric juice, pH, total acidity, Pepsin, hexose and hexosamine.

Gastric contents were assayed for total acidity by titration against 0.01 N NaOH to pH 8.0 using phenolphthalein as an indicator. The amount of HCl was calculated and expressed as μ Eq/4hrs⁶. Pepsin⁷ activity of the gastric juice was determined and expressed in terms of moles of tyrosine liberated per 4 hrs gastric juice. Other parameters measured were total hexose⁸ and hexosamine⁹.

Histopathology

Stomachs were excised and fixed in 10% buffered neutral formalin and then fixed in bovine solution, were processed for paraffin embedding following the standard microtechnic¹⁰. Sections of the stomach stained with alum – haematoxylin and eosin, were observed microscopically for histopathological changes.

Statistical Analysis

Student 'T' test was used for statistical analysis of data. The level of significance was evaluated with p values ($p < 0.001$).

Results

From the Table, it can be observed that the number of lesions in aspirin+ pylorus ligated (aspirin+PL) group was significantly high and the Aegle marmelos pretreated group depicted marked reduction. The volume of gastric juice, total acidity and pH increased in ulcerated group. The Aegle marmelos pretreated group made. The pepsin activity and hexose was insignificant in the experimental groups. The level of hexosamine content in gastric juice significantly decreased when compared to

the control and Aegle marmelos treated group. Histopathology of the induced ulcer group II shows gastric mucosa with superficial erosion, fragmented and distorted gland and inflammatory infiltrate in the lamina Propria there are character of the early stage of gastric ulcer. The drug treated group III shows the rebuilding of architecture of the gastric mucosa as that of normal control group I.

Discussion

In the present study Aegle marmelos have been shown to possess antiulcer activity against experimentally induced ulcer models, it has shown as significant reduction in the gastric lesions of the aspirin treated pylorus ligated group of animals. The severity of ulcer can be gauged by assessing the number of lesions present on the gastric surface of the gastric lumen. Re-epithelialization of the gastric mucosa results in the disappearance of lesions were evident for the potential of the drug. When the mucosal damage is acute and confined to the epithelium with the basal lamina remaining intact complete repair will occur through replacement of necrotic cells migrating from the gastric pits. Crude aqueous leaf extract of Aegle marmelos induce re-epithelialization of the gastric mucosa suggesting its antiulcerogenic property.

The beneficial antiulcerogenic effect of crude aqueous leaf extract on aspirin plus pylorus ligation induced ulcer in rats clearly indicated its cytoprotective activity, Re-epithelialization of gastric mucosa and aid in the tissue repair process were also shown in the histological section of the drug treated group. It may thus be hypothesized the aqueous extract of Aegle marmelos plays an important role in the antiulcer activity. Further studies required to elucidate the active principles present in the crude

aqueous extract of *Aegle marmelos* and its ulcer.
mechanism of prevention of the gastric

REFERENCES

1. "The wealth of India" Revised edition, CSIR Publication, New Delhi, 85. (1985).
2. Biswanth Das, Ratna Das and Chakrabarti., *Indian Drugs*, 32,93,(1995)
3. Dhar, M.L. Dhar, M.M., Dhawan, B.N., Nahrotra, B.N. and Roy, C. *Indian Journal of Experimental Biology*, 6,232 (1968)
4. Kiritkar, K.R. and Basu, B.D. "Indian Medicinal Plants, 2nd edition , International book Distributors, Dehradun, 499,(1995).
5. Shay, M., Komarov, S.A., Fels, D., Meranze, D., Grunst, H. and siplet, H. *Gastro enterology*, 5,43,(1954)
6. Oser, B.L. and sumerson, W.H. "Practical Physiological Chemistry", edited by Hawk, Mc Graw Hill Co., New York, 375 (1954).
7. Ryle, A>P., "Methods in Enzymatic analysis",Verlog, Basel, 223(1986).
8. Niebes, P. *Clin. Chem. acta*, 42,399,(1959)
9. Wangher, W.D. *Analysis of Biochemistry*, 89,4,394(1979).
10. Galigher, A. E.and Kozloff, E.N. "Essential of practical Microtechniques", 2nd edition, Lea and Febiger, Philadelphia 77 (1971).

**Table: Effect of Aegle Marmelos against aspirin+ pylorus
Ligated (PL) ulcers in rates.**

Parameters	Control	Ulcerated	Pretreated with aegle marmelos
Ulcerative lesions(n)	0	21± 1.9 ***	5±0.43***
Pepsin activity (moles of tyrosine/4hr)	620 ± 46	626 ± 53	615 ± 50
Volume of gastric content (ml/4hr)	5 ± 0.06	8.2 ± 0.09 ***	5 ± 0.15 ***
pH	3	2	3
Total acidity (µEq/4hr)	7±0.17	12±0.14***	8 ± 0.14 ***
Hexose (µg/ml)	371 ± 30	357 ± 29	365 ± 27
Hexosamine (µg/ml)	173 ± 12	99 ± 08***	149 ± 11 ***

All values represent mean + SEM of 6 animals in each group.

***P< 0.001 control versus ulcer, ulcer versus ulcer treated.