

## STUDY OF ANTIULCER ACTIVITY OF ROOTS OF *ALANGIUM SALVIFOLIUM* LINN. IN PYLORUS LIGATED RATS

Mohanty P.K.<sup>2\*</sup>, Panda S.K.<sup>1</sup>, Mishra S.K.<sup>1</sup>, Panda P.K.<sup>1</sup>, Jaliwala Y.A.<sup>2</sup>, Parle Milind<sup>3</sup>

<sup>1</sup>Dept. of Pharmacy, Utkal University Bhubaneswar, Orissa, India

<sup>2</sup>VNS Institute of Pharmacy, Bhopal, M.P., India

<sup>3</sup>Pharmacology Division, Dept. Pharm. Sciences, Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India

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\*Mohanty P.K., VNS Institute of Pharmacy, Bhopal, M.P., India, E-Mail: [pmohanty1971@gmail.com](mailto:pmohanty1971@gmail.com)

### ABSTRACT

Different extracts of *Alangium salvifolium* Linn. roots were tested for its antiulcer activity in aspirin induced and pylorus ligated rats model. The effect was assessed by parameters like Total acidity(TA), Free acidity(FA), Peptic activity(PA), Ulcer Index(UI). The antiulcer activity of all extracts were compared to the standard drug ranitidine. The study showed that all extracts were showing reductions TA, PA, FA and UI among which the extract of petroleum ether showed significant reduction upon those parameters. *Alangium salvifolium* Linn (400mg/kg) (PE extracts) shows complete inhibition ulceration and results are at par with (5mg/kg) of ranitidine.

**KEY WORDS:** *Alangium salvifolium*, total acidity, free acidity, Peptic activity and ulcer index.

### INTRODUCTION

Cimetidine, Ranitidine, Famotidine, Omeprazole, Lansoprazole etc allopathic drugs are known for their antiulcer activity.<sup>1</sup> It is known that there is no definite therapy in allopathic systems. The existing therapy causes symptomatic relief only.<sup>2</sup> This therapy only causes symptomatic relief. The most allopathic drugs after long use precipitate their own toxic activities.<sup>3</sup> It is found that some tribal's of south Orissa are using *Alangium salvifolium* root extract for treatment of peptic ulcer and hyper acidity, in such traditional use to the toxic manifestation are not found. But there is no scientific proof so far established for the complete care of the peptic ulcer in support of such utility in literature. Hence the said plant is selected to test its extracts experimentally to induced peptic ulcer in shy rat model is selected for this study.

### MATERIALS AND METHODS

*Alangium salvifolium* Linn. roots were collected from Mahuda (Orissa, India) in the month of February 2009 and authenticated by Dr. S.K. Dash of Dept of Ethnobotany. The roots were dried under shade and pulverized into powder by a mechanical grinder.<sup>4</sup> The powder was then passed through 40 mesh size sieve and stored in a close vessel for further use. The dried powdered roots of *Alangium salvifolium* were successively extracted with petroleum ether (60-80°C), chloroform, methanol and aqueous in soxhlet apparatus. After the effective

extraction the extracts are concentrated by evaporating the solvent completely.<sup>5</sup>

### ANIMALS

Adult wistar Albino rats (150-170gm) were used for this experiment, obtained from M/S Chakravorty Enterprises, Kolkata were housed in standard polypropylene cage at room temperature of 27-30°C and 60-65 relative humidity and had free access to food and water ad libitum.<sup>6</sup> The rats were used for the experiment after an acclimatization period of one week. All procedures described were and approved by the Animal Ethical committee of UDPS registration no (990/C/06/CPCSEA).

### STUDIES IN SHAY RAT

Rats weighing 150-170gms were fasted for 24hr<sup>4</sup> and care was taken to avoid coprophagy.<sup>7-8</sup> Rats were divided into six groups each group consists of six rats (both male and females). One group is kept as control and for pylorus ligation was made under the ether anesthesia. The control pylorus ligated rats (6) were administered 1% Carboxy methyl cellulose suspension soon after recovery from ether anesthesia. Similarly 2<sup>nd</sup> group are operated and administered (5mg/kg) of Ranitidine suspended in 1% Carboxy methyl cellulose. Soon after recovery from ether anesthesia similarly 4,5,6, groups were administered with Methanol extract of *Alangium salvifolium* root (100,200 and 400mg/kg) body weight dose to separate groups of Shay rats(each

group consist six Shay rats) orally. All the groups were kept separately in case and drinking water is withdrawn and left for 24hr. The animals were maintained without food and water for 24hr after pylorus ligation and were killed by spinal traction. The abdomen was opened; the oesophagus end of stomach was isolated with its contents intact. The greater curvature of the stomach was cut longitudinally and the gastric juice was collected into a beaker and washings were collected into a beaker. Distilled water 9ml was added and centrifuged. The volume of the supernatant liquid was measured and aliquots were taken to determine the total acidity, free acidity, peptic activity of gastric juice. The stomach mucosa was observed for ulcer after washing with stream of tap water.<sup>9</sup>

In preliminary study of Pet.ether extract, aqueous extract did not protect the mucosa and acidity was not reduced. So these were not tried in further number of rats.

#### TOTAL ACIDITY

A volume of 5ml diluted gastric juice was titrated with 0.01 N sodium hydroxide run from a micro burette using phenolphthalein as an indicator and the acidity was expressed as mg.HCl/100gm body weight of rat.

#### FREE ACIDITY

It is determined by using Toffer's reagent as an indicator and titrating with sodium hydroxide which was run until canary yellow color was observed.

#### PEPTIC ACTIVITY

The method Lowry *et.al.* 1951 was used and the activity was expressed as  $\mu$  mol Tyrosine/100gm body weight<sup>5</sup>.

#### ULCER INDEX

The method of Anderson and Soman (1965) was followed for scoring the ulcer index.

#### RESULTS AND DISCUSSION

Results are interpreted in the Table-1 and shown in Figure-1 Ranitidine significantly reduced total acidity, free acidity, peptic activity and ulcer index by 72%, 87.41%, 24.153%, 100% respectively. In case of preliminary study with 400mg/kg body weight dose of chloroform, methanol, aqueous extracts of roots of *Alangium salvifolium* didn't shown any remarkable inhibition of free acidity, total acidity, peptic activity and ulcer index. The petroleum ether extract at dose of (100, 200, 400mg/kg) body weight reduced the total acidity, free acidity, peptic activity and ulcer index dose dependently. Ulceration was inhibited 11.11%, 53.34%, 100% by (100, 200, 400mg/kg) respectively in petroleum ether extract of *Alangium salvifolium*.

Similarly the free acidity was reduced by 33.34%, 51.85%, 70.38% respectively. The total acidity was reduced by 19.84%, 35.36%, 67.36% respectively by (100, 200, 400mg/kg) of petroleum ether extract of leaves of *Alangium salvifolium* respectively. The peptic activity was reduced by 19.413%, 18.007%, 17.819% by (100, 200, 400mg/kg) of petroleum ether extract of roots of *Alangium salvifolium*. On the basis of observations it was confirmed that the active principle present in petroleum ether extract of *Alangium salvifolium* is responsible for reducing total acidity, free acidity, peptic activity and ulcer index consequent upon which the ulcer indices were dose dependently reduced by these active constituents. The active constituents present in (400mg/kg) of petroleum ether extract of leaves of *Alangium salvifolium* completely inhibited the ulceration & gives protection as given by (5mg/kg) body weight of ranitidine in shay rat.

It was found that the dose is safe up to (400mg/kg) body weight in case of all extracts. Studies are under progress to isolate the active constituent present in petroleum ether extract & those active constituent will be tested for their antiulcer activity in further studies.

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Table 1: Effect of different extract of *Alangium salvifolium* on rats, free acidity, Total acidity, Peptic activity, Ulcer index in shay rats and its comparison with Ranitidine

| Treatment       | Dose in mg/kg | FA in mg/100gm              | TA in mg/100gm             | PA in mg/100gm                   | UI              |
|-----------------|---------------|-----------------------------|----------------------------|----------------------------------|-----------------|
| Vehicle Control | 1% CMC        | 2.7±0.05                    | 12.5±0.06                  | 1800±0.0672                      | 4.5+            |
| PEAS            | 100++         | 1.8±0.03<br>(33.34)         | 10.02±0.025<br>(19.84)     | 1450.57±0.0921<br>(19.413)       | 4.0+<br>(11.11) |
| PEAS            | 200++         | 1.3±0.02<br>(51.85)         | 8.08±0.056<br>(35.36)      | 1475.89±0.0092<br>(18.007)       | 2.1<br>(53.34)  |
| PEAS            | 400++         | 0.80±0.03<br>**<br>(70.38)  | 4.08±0.069<br>*<br>(67.36) | 1479.26±0.0821<br>**<br>(17.819) | 0<br>(100)      |
| CEAS            | 400+          | 2.6±0.025<br>(3.70)         | 12.4±0.032<br>(0.8)        | 1790.05±0.2569<br>(0.552)        | 4.4<br>(2.2)    |
| MEAS            | 400+          | 2.5±0.053<br>(7.40)         | 12.3±0.062<br>(1.6)        | 1788.09±0.0321<br>(0.662)        | 4.4<br>(2.2)    |
| AEAS            | 400+          | 2.4±0.069<br>(11.11)        | 12.35±0.029<br>(1.2)       | 1791.91±0.0692<br>(0.449)        | 4.3<br>(4.5)    |
| Ranitidine      | 5mg/kg        | 0.34±0.17<br>***<br>(87.41) | 3.5±0.72<br>***<br>(72)    | 1365.25±0.1852<br>(24.153)       | 0<br>(100)      |

PEAS –Petroleum ether extract of *Alangium salvifolium* root

CEAS – Chloroform extract of *Alangium salvifolium* root

MEAS – Methanolic extract of *Alangium salvifolium*

AEAS - Aqueous extract of *Alangium salvifolium*

FA – Free acidity

TA – Total acidity

PA – Peptic activity

UI - Ulcer index

n=6, value expressed as mean±SD., One way ANOVA followed by Dunnet's t-test., \*: PO.05 \*\* : PO.01, \*\*\*: P<0.001. Value in ( ) represents percentage in reduction

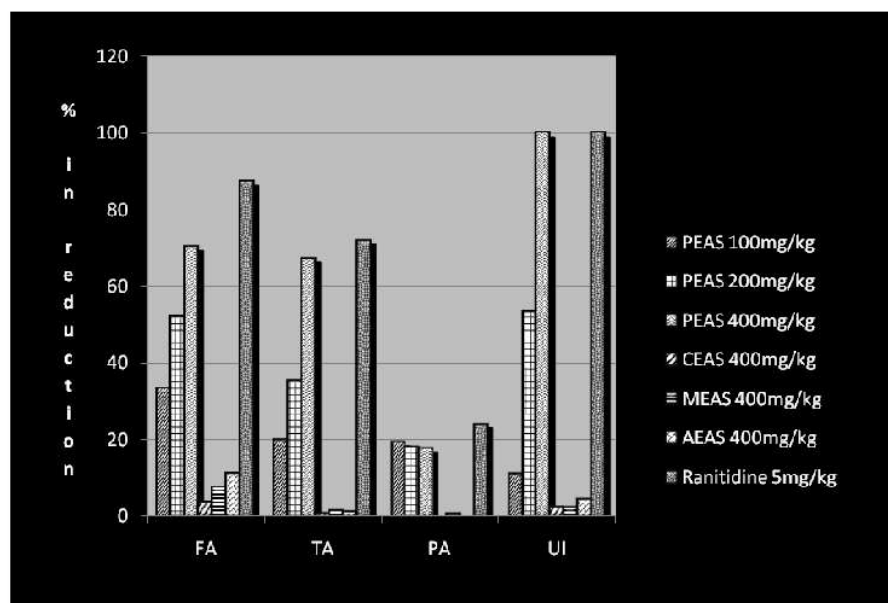


Figure 1: Bar Chart of Comparison of % Reduction of observed activities of different extract with Ranitidine in shay rats.

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