EVALUATION OF IN-VIVO GASTRO PROTECTIVE ACTIVITY OF VARIOUS EXTRACT OF VENTILAGO MADERASPATANA BARK INDUCED BY HCl - ETHANOL IN RATS

Velayutham Mani Mala*1, P. Pon Malar2, P. Essly Selva Jasmine3 and J. Amutha Iswarya Devi4

1Department of Pharmaceutical Chemistry, St.Mariam College of Pharmacy, Tirunelvelli, Pudur – 627851.
2Department of Pharmaceutics, St.Mariam College of Pharmacy, Tirunelvelli, Pudur – 627851.
3Department of Pharmacology, S.A.Raja College of Pharmacy, Vadakangulam, (Near by Nagercoil) – 627116.
4Department of Pharmaceutical Chemistry, St.Mariam College of Pharmacy, Tirunelvelli, Pudur – 627851.

ABSTRACT

Aim: The Ventilago maderaspatana plant bark is commonly used for the treatment of gastric ulcers. The present study evaluated the gastro protective activities of various solvent extract like chloroform and ethanol of Ventilago maderaspatana bark against ulcer lesions induced by HCl - ethanol in rats Methodology: The shade dried bark part of powder was extracted with chloroform and ethanol by continuous hot percolation method using Soxhlet apparatus. Results: The ulcer score was reduced from group 1 negative control was 7.20 ± 0.72 ulcer indexes and there are no ulcer inhibitions. Then group 2 standard drug of sucralfate was 2.5 ± 0.25** ulcer index and 65.27% of percentage ulcer inhibition. Group 3 chloroform extract (100 mg/kg) was 6.5 ± 0.65* ulcer index and 9.72% of percentage ulcer inhibition. Group 4 chloroform extract (200 mg/kg) was 5.5 ± 0.55* ulcer index and 23.61% of percentage ulcer inhibition. Group 5 ethanolic extract (100 mg/kg) was 4.2 ± 0.42* ulcer index and 41.66% of percentage ulcer inhibition. Group 6 ethanolic extract (200 mg/kg) was 2.9 ± 0.29* ulcer index and 59.72% of percentage ulcer inhibition. Conclusions: The investigation for the gastro protective activity
revealed that the ethanolic extract of *Ventilago maderaspatana* showed a comparable dose dependent gastro protective activity in HCl – ethanol induced method. The chloroform extract of *Ventilago maderaspatana* was devoid or less active against the gastric lesions induced by this method.

**KEYWORDS:** Antiulcer activity, Chloroform, Ethanol, sucralfate and *Ventilago maderaspatana*

**INTRODUCTION**

The world health organization (WHO) has recently defined traditional medicine (including herbal drugs) as comprising therapeutic practices that have been in existence, often for hundreds of years, before the development and spread of modern medicine and are still in use today. The traditional medicine is the synthesis of therapeutic experience of generations of practising physicians of indigenous system of medicine.

Ulcer is a common gastrointestinal disorder which is seen among many people. It is basically an inflamed break in the skin or the mucus membrane lining the alimentary tract. Ulcers are an open sore of the skin or mucus membrane characterized by sloughing of inflamed dead tissue. Ulcers are lesions on the surface of the skin or a mucous membrane characterized by a superficial loss of tissue. Ulcers are most common on the skin of the lower extremities and in the gastrointestinal tract, although they may be encountered at almost any site.[1] Ulceration occurs when there is a disturbance of the normal equilibrium caused by either enhanced aggression or diminished mucosal resistance. It may be due to the regular usage of drugs, irregular food habits, stress, and so forth.

Peptic ulcer is one of the world’s major gastrointestinal disorders and affecting 10% of the world population. About 19 out of 20 peptic ulcers are duodenal. An estimated 15,000 deaths occur each year as a consequence of peptic ulcer. Annual incidence estimates of peptic ulcer haemorrhage and perforation were 19.4–57 and 3.8–14 per 100,000 individuals, respectively. The average 7-day recurrence of haemorrhage was 13.9% and the average long-term recurrence of perforation was 12.2%.

A number of synthetic drugs are available to treat ulcers. But these drugs are expensive and are likely to produce more side effects when compared to herbal medicines In the Indian
pharmaceutical industry, antacids and antiulcer drugs share 6.2 billion rupees and occupy 4.3% of the market share.

MATERIALS AND METHODS

1. Collection and identification of *Ventilago maderaspatana*

The bark of *Ventilago maderaspatana* was collected from Rajapalayam, Virudhunagar District of Tamil Nadu, India. Taxonomic distinguishing proof was produced using The American College, Madurai, Madurai District, Tamil Nadu. The plant of *Ventilago maderaspatana* and were dried under shadow, segregated, crushed by a mechanical processor and went through a 40 lattice sifter. The plant powdered materials were put away in a hermetically sealed holder.

2. Preparation of plant extract

2.1. Apparatus

The apparatus used for continuous hot percolation process is soxhlet apparatus which consist of three parts:

- Flask containing the boiling solvent.
- Soxhlet Extractor in which the drug to be extracted is packed. It has a side tube which carries the vapours of the solvent from the flask to the condenser and a syphon tube which syphons over the extract from soxhlet extractor to the flask.
- A condenser in which the vapours of the solvent are condensed again into solvent.

2.2. Procedure

The drug to be extracted is packed in a paper cylinder made from a filter paper and it is placed in the body of soxhlet extractor. The solvent (Ethanol or chloroform) is placed in the flask. When solvent is boiled (70–80°C) on heating the flask, it gets converted into vapours. These vapours enter into the condenser through the side tube and get condensed into hot liquid which falls on the column of the drug. When the extractor gets filled with the solvent, the level of syphon tube also raise up to its top. The solvent containing active constituents of the drug in the syphon tube syphon over and run into the flask, thus emptying the body of extractor. This alternation of filling and emptying the body of extractor goes on continuously. The soluble active constituents of the drug remain in the flask while the solvent is repeatedly volatilised. The process of filling and emptying of the extractor is repeated until the drug is exhausted. This Process is continued for 7 days. The ethanol and chloroform extract were collected. The extract were concentrated by distillation and dried.
The bark powder samples of *Ventilago maderaspatana* were extracted with ethanol and chloroform at temperature between 60-70°C by using soxhlet extractor. The solvent was evaporated by rotavapor to obtained viscous semi solid masses.

3. Experimental Animals
Rats of either sex weighing about 150-200 g were used. The animals were maintained in colony cages at 25 – 27 °C, relative humidity 50-55 % maintained under 12 h light and dark cycle (6 – 18 light and 18 – 6 h dark). The animals were fed with Standard animal feed (Hindustan Lever Ltd.) and water. All animals were acclimatized to the laboratory conditions prior to experimentation.

4. Drugs and Solvents
4.1. Drugs
- Chloroform extract of Ventilago maderaspatana : (100 and 200 mg/kg)
- Ethanol extract of Ventilago maderaspatana : (100 and 200 mg/kg)
- Standard drug – Sucralfate : (500 mg/kg)

4.2. Solvents
- Chloroform
- Ethanol
- Distilled water

5. Antiulcer activity
5.1. Inducing agent
Table No 1: Divided into Six groups (HCl – Ethanol).

<table>
<thead>
<tr>
<th>S. No</th>
<th>Groups</th>
<th>Extract with Dose and Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Groups 1</td>
<td>Negative control</td>
</tr>
<tr>
<td>2</td>
<td>Groups 2</td>
<td>Sucralfate (500 mg/kg, orally)</td>
</tr>
<tr>
<td>3</td>
<td>Groups 3</td>
<td>Chloroform extract (100 mg/kg, orally)</td>
</tr>
<tr>
<td>4</td>
<td>Groups 4</td>
<td>Chloroform extract (200 mg/kg, orally)</td>
</tr>
<tr>
<td>5</td>
<td>Groups 5</td>
<td>Ethanolic extract (100 mg/kg, orally)</td>
</tr>
<tr>
<td>6</td>
<td>Groups 6</td>
<td>Ethanolic extract (200 mg/kg, orally)</td>
</tr>
</tbody>
</table>

Ulceration in Rats was induced by oral administration of HCl - ethanol mixture (1.5ml) containing 0.15 N HCl in 70 % v/v ethanol. Four hours after the induction of ulcer, the animals were sacrificed by decapitation. The stomach was opened and the percentage inhibition of ulcer was determined (Ganguly & Bhatnagar, 1973).
A score for the ulcer was made as follows:
- 0 : Normal colour stomach
- 0.5 : Red coloration
- 1.0 : Spot ulcers
- 1.5 : Haemorrhagic streak
- 2.0 : Ulcers
- 3.0 : Perforation

5.2. Statistical analysis
Comparisons between treatment and control groups were performed using one way ANOVA followed by Dunnet test. Values in Table 1 are expressed as arithmetic mean ± SEM. The significance levels were analysed at **P<0.01 and *P<0.05.

RESULTS AND DISCUSSIONS
1. HCl – Ethanol induced ulceration in rats
The characteristic striated lesions which results from the oral intake of HCl – ethanol solution were found. Ethanolic extract of Ventilao maderaspatana bark and sucralfate (Standard) pre-treatment provided a significant protection against ulceration caused by HCl – ethanol solution. The mean ulcer score was reduced from 7.20 (control) to 2.9 for the group 6 with highly significant value (p<0.05). While the chloroform extract at the dose of 200 mg/kg showed 23.61% of ulcer protection. While the ethanolic extract at the dose of 100 mg/kg showed 41.66 % ulcer protection. Chloroform extract showed very little activity with just 9.72 % protection in the dose level of 100 mg/kg.

Table No 2: Effects of various extracts against HCl – Ethanol induced gastric lesions in rats.

<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>Ulcer Index (Mean ± SEM)</th>
<th>% Ulcer inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-1 (Negative control)</td>
<td>7.2 ± 0.72</td>
<td>-</td>
</tr>
<tr>
<td>Group-2 (Standard 500mg/kg)</td>
<td>2.5 ± 0.25*</td>
<td>65.27%</td>
</tr>
<tr>
<td>Group-3 (Chloroform 100mg/kg)</td>
<td>6.5 ± 0.65*</td>
<td>9.72%</td>
</tr>
<tr>
<td>Group-4 (Chloroform 200mg/kg)</td>
<td>5.5 ± 0.55*</td>
<td>23.61%</td>
</tr>
<tr>
<td>Group-5 (Ethanol 100mg/kg)</td>
<td>4.2 ± 0.54*</td>
<td>41.66%</td>
</tr>
<tr>
<td>Group-6 (Ethanol 200mg/kg)</td>
<td>2.9 ± 0.35**</td>
<td>59.72%</td>
</tr>
</tbody>
</table>

Results are expressed as mean ± SEM from above observation are compared to control group by one way ANOVA followed by Dunnet test. *p<0.01; **p<0.05
DISCUSSION

1. HCl – Ethanol Induced Ulcer in Animal Model

The investigation for the gastro protective activity revealed that the ethanolic extract of Ventilago maderaspatana showed a comparable dose dependent gastro protective activity in HCl – ethanol induced method. The chloroform extract of Ventilago maderaspatana was devoid or less active against the gastric lesions induced by this method. In HCl – ethanol induced ulcer are inhibited by sucralfate which releases endogenous prostaglandins. Hence, sucralfate was used as the standard drug in this model. The untreated rats (Control group) had severe ulceration caused by HCl – Ethanol and had a high ulcer index of 7.2, While the rats pretreated with sucralfate and ethanolic extract of Ventilago maderaspatana showed very good protection against HCl – Ethanol induced ulcer. The results suggest that the ethanolic
extract of *Ventilago maderaspatana* possessed good cytoprotection, while the chloroform extract had diminished activity towards the same.

**REFERENCE**


