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Research Article.....!!!

**EVALUATION OF ANTI ULCER ACTIVITY OF ETHANOLIC LEAF
EXTRACT OF *BOERHAAVIA DIFFUSA* LINN****DR.S. SENTHILKUMAR**

Karur, Tamilnadu, India.

ABSTRACT**KEYWORDS:**

Anti ulcer activity,
Ethanol, *Boerhaavia
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For Correspondence:**DR.S.SENTHILKUMAR.****Address:**

Karur, Tamilnadu, India.

Many people in the world suffer from peptic ulcers. Of the two main types types of peptic ulcer (gastric and duodenal) that develop in humans, gastric ulcers are the most commonly found. Although many medications are currently available for the management of gastric ulcers, prolonged use of these drugs may lead to serious of adverse effects such as thrombocytopenia, nephrotoxicity, hepatotoxicity, gynecomastia and impotence. With the increasing tendency for use of herbal drugs for the alleviation of various disease condition associated with belief that natural compounds produce less toxic side effects, much research is now being carried out worldwide, to investigate the potential of plants and plant based medicines to protect against the development of gastric ulcers or alleviate symptoms associated with the conditions.

INTRODUCTION:

Ulcers are lesions of the skin or mucous membrane characterized by the superficial in flamed dead tissue (1). Among different types of ulcers that can develop, peptic ulcers are the most common. Peptic ulcers can develop on the inside lining of the stomach (gastric ulcer) or the small intestine (duodenal ulcer) (2). Gastric ulcer, one of the widest spread, is believed to be due to an imbalance between aggressive and protective factors (3). Studies have shown that gastric ulcer occurs at least 10% of the world's population (4). The major protective factors include adequate blood flow, secretion of prostaglandins, mucin, nitric oxide, bicarbonate and growth factors. Aggressive agents include increased secretion of hydrochloric acid and pepsin, inadequate dietary habits, free oxygen radicals, the consumption of non-steroidal anti-inflammatory drugs and alcohol, stressful conditions and infection with *Helicobacter Pylori* (5,6). Several drugs such as anticholinergic drugs, Histamine H₂ receptor antagonists, antacids and irreversible proton pump inhibitors have been used for the treatment of gastric and duodenal ulcer (7). Therefore, during the past few years, there has been an increasing interest in the development of plant based gastro protective agents that are believed to produce less toxic side effects (8,9).

Materials and Methods:**Collection of Plant Material:**

The leaves of *Boerhaavia diffusa* was collected from Paramathy, near Karur District in Tamil Nadu.

Sample preparation:

Coarse powder from the shade dried plant material was exhaustively extracted with ethanol to yield a dark greenish semisolid residue. The dried extract was dissolved in distilled water right before use.

Indomethacin (IND) induced ulcers:

The experiment was performed according to the method of Djahanguiri (6). Four groups of male Wistar rats (n = 6) were fasted overnight prior to the start of the experiment, and water *ad libitum*. The first group received distilled water, while the second group was treated with omeprazole (10 mg kg⁻¹ day⁻¹, P.O.). Whereas third to sixth groups were administered with the ethanolic extract of present study plants (200 and 400 mg kg⁻¹ day⁻¹, P.O. respectively). On day third after 30min of omeprazole and plant extract treatments, indomethacin (50 mg kg⁻¹) suspended in 0.5% carboxymethyl cellulose was given as a single oral dose to groups 2-4 to induce gastric ulcers.

After 5 h, the animals were sacrificed with overdose of diethyl ether and each stomach was examined for ulcer index.

Experimental design:

Group-I : Control which received distilled water orally.

Group-II : Omeprazole (10 mg kg⁻¹day⁻¹P.O)

Group-III : Served as test sample which received ethanolic leaf extract of 200 mg kg⁻¹
P.O of *Boerhaavia diffusa*.

Group-IV : Served as test sample which received ethanolic leaf extract of 400 mg kg⁻¹
P.O of *Boerhaavia diffusa*.

Ulcer index:

The stomach were removed and opened along the greater curvature, washed gently in normal saline and the mean ulcer index was calculated. The number of ulcer lesions was counted using a magnifying glass and the diameter of the ulcer was measured using a vernier caliper. Ulcer index was determined by following the scoring method of *Suzuki et al. (7)*.

Score 1 : maximal diameter of 1mm

Score 2 : maximal diameter of 1-2 mm

Score 3 : maximal diameter of 2-3 mm

Score 4 : maximal diameter of 3-4 mm

Score 5 : maximal diameter of 4-5 mm

Score10: maximal diameter of 5 mm and above

Score25: a perforated ulcer.

The sum of the length (mm) of all lesions for each stomach was used as the ulcer index(UI), and the protection percentage was calculated from the following formula:

$$\text{Percentage protection} = \frac{\text{UI control} - \text{UI treated}}{\text{UI control}} \times 100$$

Statistical analysis:

The data presented here are means \pm SD of 6 rats in each group. The results were analyzed using one-way analysis of variance (ANOVA) and the group means were compared by Duncan's Multiple Range Test (DMRT) using Statistical Program for Social Sciences (SPSS version 16.0) software for windows. The findings were considered statistically significant at $p < 0.05(10)$.

Table-1. Effect of ethanolic extract of *Boerhaavia diffusa* on ulcer index of indomethacin induced gastric ulcer in rats.

Groups	Ulcer score	Percentage protection (%)
Induced	35.15 ± 0.99	-
Standard	10.33 ± 0.69	70.60
Low dose (200mg/kg b.w)	22.89 ± 0.40	34.88
High dose (400mg/kg b.w)	13.57 ± 0.31	61.38

Values are expressed as mean ± SD(n=6).

RESULTS AND DISCUSSION:

To validate the presence of gastro protective properties of medicinal plants used by traditional medical practitioners to treat gastric ulcers, or to discover leads for the development of novel agents from plants for gastric ulcer therapy, it is essential to carry out scientifically controlled investigations to determine if these plant material truly have the ability to product against the development of gastric ulcers or alleviate the signs and symptoms associated with the condition(Table-1).

Extracts of plants demonstrating such properties should be further developed into forms that can be conveniently used in clinical practice for the management of gastric ulcers or as adjuncts to existing therapies to reduce their toxic side effects. Thus , it gives a broad view of the issue that will help to select the most appropriate model for the validation of existing traditional therapies for gastric ulcers and development of novel plant based drugs that could be used for their prevention and cure.

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