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RESEARCH ARTICLE

Assessment of Anti-Ulcer Activity of *Corbichonia decumbens* Forsk. Methanolic Extract by Aspirin plus Pyloric Ligation Model

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ABSTRACT

The objective of present study is to evaluate the anti-ulcer activity of methanolic extract of leaf and Root of *Corbichonia decumbens*. The cause of ulceration in patients is mainly due to hyper secretion of gastric juice and pepsin. In traditional system of medicine a number of herbal preparations have been used for the treatment of peptic ulcers. The anti-ulcer activity of methanol extract of *Corbichonia decumbens* leaf and Root were investigated by aspirin plus pylorus ligation induced gastric ulcer in rats. In aspirin plus pylorus ligation model, *Corbichonia decumbens* at doses of 200 mg/kg produced significant reduction in gastric volume, free acidity and ulcer index compared to control. It can be concluded that methanol extract of *corbichonia decumbens* possesses antiulcerogenic as well as ulcer healing properties, which might be due to its antisecretory activity.

KEYWORDS

Anti-Ulcer, *Corbichonia Decumbens*, Pylorus Ligation

INTRODUCTION

Ulcer has been long recognized as one of the most important problem in developing countries. About 70% population in developing countries relies on traditional medicine for their primary health care needs.[1] With the ever growing interest in natural medicine, many plants have been screened and reported to be useful in treating and managing ulcer. Ulcers are an open sore of the skin or mucus membrane characterized by sloughing of inflamed dead tissue[2]. 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.

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Ulcers on the digestive tract membranes are called peptic ulcers or (stomach ulcers or duodenal ulcers).[3] Even though a range of drugs are available for the treatment of ulcer, many of these do not fulfill all the requirements and have side effects.[4-5] Current treatment of ulcers in developing countries has been largely suppression of pain, with little or no strategy aimed at a cure. Herbal medicine is fast emerging as an alternative treatment to available synthetic drugs for treatment of ulcer possibly due to lower costs, availability, fewer adverse effects and perceived effectiveness. Many tropical herbs have been scientifically reported to possess potent antiulcer activity.[6-9]

MATERIALS AND METHOD

Plant Material

Plant material of *Corbichonia decumbens* was collected from Vijayamangalam, Erode district, Tamilnadu, during the month of December

2012. The plant specimens was identified with Gambles Flora of the Presidency of Madras and identify is confirmed with the herbarium specimen deposited in Kongunadu Arts and Science college herbarium, Coimbatore.

Preparation of Extract

The leaf and root of *C. decumbens* were dried under shade and then powdered with a mechanical grinder. The dried powders of leaf and root of *C.decumbens* were defatted with methanol (60-80ºc) in a Soxhlet Apparatus by continuous hot- percolation. The solvent was removed by distillation under low pressure and evaporation. The resulting semisolid mass was vacuum dried by using rotary flash evaporator. The resultant dried extracts were used for further study.

Animals

Wister albinos rats (120-150 g) of either sex and of approximate same age are used in the present studies were procured from listed suppliers of animal breeding center veterinary college trissur, kerala India. The animals were fed with standard pellet diet and water ad libitum. All the animals were housed in polypropylene cages. The animals were kept under alternate cycle of 12 hours of darkness and light. The animals were acclimatized to the laboratory condition for 1 week before starting the experiment. The animals were fasted for at least 12 hours before the onset of each activity. The experimental protocols were approved by Institutional Animal Ethics Committee (659/02/a/CPCSEA) after scrutinization. The animals received the drug treatments by oral gavage tube.

Oral Acute Toxicity Study

The LD50 was determined using the graphical method[10] in mice. Briefly, geometric doses of the extract (100–200mg/kg) were administered i.p. to 4 groups of mice each consisting of six animals. Control group received normal saline (5 mL/kg i.p.). Signs of toxicity and mortality within 24-72 h were noted. Confirmatory test was carried out and the LD50 was calculated from the graph of percent mortality against profit log dose of the extract. The lethal dose (LD 50) of the methanolic extract of dried leaf and root of *C.decumbens* were determine by OECD guideline.[11] The LD50 of methanolic extract was found to be 200 mg/kg therefore the LD50 value is 200mg/kg.

Aspirin plus Pylorus Ligation Induced Ulcer

The rats were divided into 5 groups (n=6). Methanolic extract of leaf and root extract of ***C.decumbens***, aspirin and standard antiulcer drug ranitidine were prepared with 0.5% Carboxy methyl cellulose, as vehicle and administered orally once daily at a volume of 10 ml/kg b.wt. For 7 days using oral gavage needle.

Group I: Rats administered with 0.5% CMC, served as untreated control.

Group II: Rats received aspirin alone (200 mg/kg b.wt.) and served as ulcer control group,

Group III: Rats treated with aerial methanol extract (200 mg/kg b.wt.),

Group IV: Rats treated with root methanol extract (200 mg/kg b.wt.)

Group V: Rats received Ranitidine (20 mg/kg b.wt.).

From days 5 to 7, animals in group II to V received aspirin at a dose of 200 mg/kg b.wt., 2 h after the administration of respective drug treatment. Animals in all groups were fasted for 18 h after the assigned drug treatment and were anaesthetized with anesthetic ether. The abdomen was cut open by a small midline incision below the xiphoid process and pylorus portion of stomach was lifted out and ligated. Precaution was taken to avoid traction to the blood supply. The stomach was sutured and replaced carefully and the abdomen wall was closed in two layers with interrupter sutures. The animals were deprived of water during post-operative period.[12,13] After 4 h of pyloric ligation, the animals were sacrificed, the stomach was opened, and the gastric secretion was collected. Ulcer index was determined by the method of[14] from the glandular part of the stomach. Biochemical assay of the following parameters was performed. Free and total acidity were

measured by the method of[15] Pepsin activity of gastric juice was determined by the method of[16] Total carbohydrates (TC) were estimated in terms of total hexose, hexosamine and fucose by[17] method. Protein content (PR) was determined by the method of Lowery et al.[18]

Statistical Analysis

The statistical analysis was carried out using one-way ANOVA followed by Dunnett's multiple comparison tests. All the results obtained in the study were compared with the vehicle control group. P values <0.05 were considered as statistically significant.

RESULTS

Effect of standard drug randitine and test extract of *C.decumbens* on gastric volume, free acid, total acid, pH and ulcer index in pylorus ligated rats were studied. In pyloric ligation induced ulcer model, Oral administration of C.decumbens (leaf and root) extract in dose showed significant reduction in ulcer index, gastric volume, free acidity, total acidity pepsin as compared to the control group randitine. It was showing protection index at the dose of 200 mg/kg respectively in comparison to control whereas randitine as reference standard drug was reduction of ulcer (Results are tabulated in Table-1, Fig 1).

Table 1: Effect of methanol extract of *C.decumbens* on ulcer index score against aspirin induced pylorus ligation ulcer in rats.

Group	Gastric juice volume	pH	Ulcer index
I (Normal)	4.06±0.32	5.8±0.12	-
II (Asprin induced)	3.96±0.77	3.1±0.9	5.4±0.82
III (Aerial extract)	4.01±0.20	4.3±0.51	2.73±0.5
IV (Root extract)	3.99±0.12	4.08±0.20	3.23±0.36
V (Ranitidine)	4.14±0.24	5.11±0.98	0.89±0.21

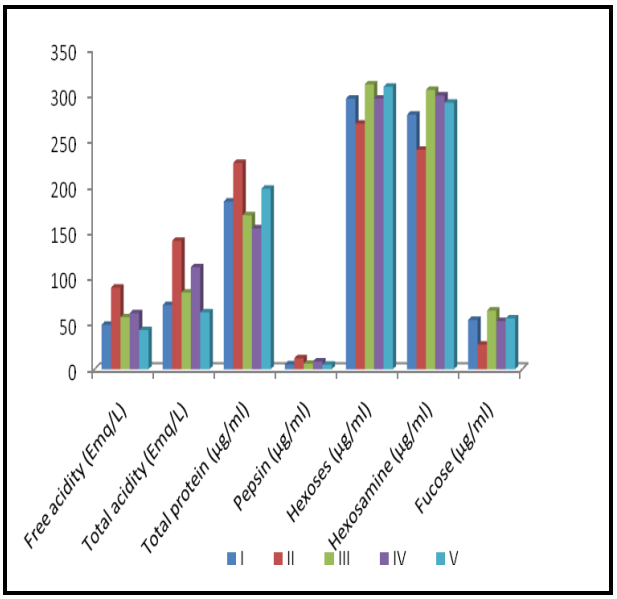

Figure 1: Effect of methanol extract of *C.decumbens* on ulcer index score against aspirin induced pylorus ligation ulcer in rats

DISCUSSION

Ulcers develop when the normal defense and repair mechanisms of the lining of the stomach or duodenum are weakened, making the lining more likely to be damaged by gastric acid.[19] In pylorus-ligated model, free acidity decreases with no significant changes in the gastric volume, pH, total acidity and pepsin in both dose levels of the test extract.[20] The anti-ulcer activity of the plant of Mimosa pudica was evaluated by employing asprin, alcohol and pylorus ligation ulcer models. These models represent some of the most common causes of gastric ulcer in humans. Many factors and mechanisms are implicated in the ulcerogenesis and gastric mucosal damage induced by different models employed in the present study involving, depletion of gastric wall, mucin mucosal damage induced by nonsteroidal anti-inflammatory drugs and free radical production.[21] Methanol extract of the plant of Momordica cymbalaria was significantly effective in protecting gastric mucosa against aspirin induced ulcers at all the dose level studied. It has been proposed that in pyloric ligation, the digestive effect of accumulated gastric juice and interference of gastric blood

circulation are responsible for induction of ulceration.[22]

The current study showed that gastric juice in the C.decumbens leaf and root extract received 200 mg/kg b.wt. of the methanol extracts of C.decumbens respectively Showed a significant ($P<0.01$) increase in gastric juice pH, reduces the gastric volume, total acidity when compared to control.

CONCLUSION

It was concluded that methanolic extract of Corbichonia decumbens leaf and root extract showed significant anti-ulcer activity in aspirin plus pyloric ligation model in rat. Further study is required to determine the mechanism of action of the plant and to open the gateway for potential drug development in the future.

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