



Short Communication

ANTIULCER ACTIVITY OF PETROLEUM ETHER EXTRACT OF *BETA VULGARIS* (L.)

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ABSTRACT

Objectives: The present study was designed to evaluate the antiulcer activity of petroleum ether extract of *Beta vulgaris* L.

Methods: Present study was designed to investigate the antiulcer activity of petroleum ether extract of *Beta vulgaris* L. Wistar rats were used and divided into three groups. Group one to three received tween 80 (negative control), aspirin (Positive control), and 200mg/kg of petroleum ether extract of *Beta vulgaris* and aspirin respectively. After 12h fasting period, aspirin 200mg/kg orally administered to group two and three. Rats were sacrificed 5h after aspirin treatment. Stomach was analyzed for histological changes.

Results: Aspirin control shown damaged gastric architecture with dead neutrophils and pus formation of gastric mucosal layer, whereas rats pretreated with petroleum ether extract showed few inflammatory cells presented only in the base of the mucosal layer.

Conclusion: Results of this study showed that, pretreatment with petroleum ether extract of *Beta vulgaris* L. provided moderate significant protection against aspirin induced gastric ulcers.

Keywords: Antiulcer, Histology, Petroleum ether extract, Aspirin.

INTRODUCTION

Aspirin is belonging to the NSAIDs and it produces undesirable side effects such as gastrointestinal ulcers, stomach bleeding and tinnitus, especially at higher dose or chronic use. Several drugs widely used to prevent these side effects, which include H₂ receptor antagonist and proton pump inhibitors. Due to problems associated with current treatment, there is a need to seek alternative drug source against gastric ulcers.

Beta vulgaris belonging to the family "Chenopodiaceae" and is extensively cultivated in many parts of the India. Recently Indrani et al., (2014) and Chakole et al., (2011) are demonstrated the antioxidant, antihyperglycemic,

antinociceptive and antiinflammatory effect of methanolic extract of *Beta vulgaris* [1, 2]. However, no study was done on antiulcer activity of petroleum - ether extract of *Beta vulgaris*. Therefore, the present study has been designed to investigate the petroleum-ether extract of *Beta vulgaris* for its antiulcer effect.

MATERIALS AND METHODS

Beta vulgaris roots were procured from the local market and they were thoroughly washed under running water, shade dried for a week at 35 - 40°C, pulverized in an electric grinder. The powdered roots were [3] soaked in petroleum ether for 10 days and filtered. The solution evaporated in vacuo gave a semi - gelatinous extract (Yield: 8.5%). The

extract was suspended in tween 80 just before administration.

Animals

Wistar rats (175-200g) were procured from the institutional animal house. The animals had free access to standard pellet feed (Provomi) and water ad libitum under strict hygienic conditions and maintained in room temperature of $25\pm 1^{\circ}\text{C}$, relative humidity 45- 55% and a 12:12h light/dark cycle. All the experiments were conducted in strict compliance according to ethical principles and guidelines provided by Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) and the study protocol was approved by the institutional animal ethical committee.

Preliminary Chemical test

The petroleum ether extract of Beta vulgaris roots were subjected to qualitative chemical investigations for the identification of phyto constituents [4] like steroids, tannins, alkaloids, carbohydrates, flavonoids and glycosides using appropriate reagents.

Acute toxicity studies

Acute oral toxicity study was performed according to Organization for Economic Cooperation and Development (OECD 423) guidelines. [5] Wistar rats of either sex weighing 175-200g were used for this purpose. Tween-80 1% v/v was used as vehicle to suspend the petroleum-ether extract. The petroleum-ether extract was administered in a dose of 2g/kg orally to a group of three rats. The animals were continuously observed for changes in autonomic or behavioral response for 6hrs. The animals were kept under observation for 14 days to detect any mortality.

Aspirin induced ulcers in rats. [6]

Wistar rats used and divided into three groups. The petroleum ether extract of Beta vulgaris (200mg/kg) is administered orally in 0.1% Tween 80 solution for two consecutive days to group -3. After 12 hour fasting period, aspirin (200 mg/kg, 4 mg/ml dissolved in 0.1% Tween 80 solution) was administered orally to group - 2 & 3. Control group treated with 0.1% Tween 80 solution. Five hours later, the rats are sacrificed under ether anaesthesia and their stomach was excised. They were opened along the greater curvature, then washed in warm water, and examined under a 3-fold magnifier. Then the part of the stomachs was fixed in buffereal formalin (10%) solution for histological

evaluation. The fixed stomachs were embedded in paraffin wax to produce paraffin wax tissue sections then $5\mu\text{m}$ sections with H&E evaluated for microscopical examination.

RESULTS

Phytochemical Screening

The percentage yield of petroleum-ether extract of roots of Beta vulgaris was found to be 10.6%w/w. The chemical tests indicate the presence of sterols, carbohydrates, tannins, phenols, glycosides and alkaloids in the petroleum ether extract.

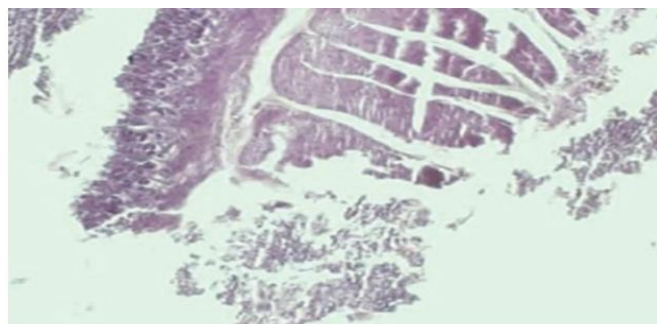


Fig-1: Photomicrograph of Aspirin control group showing the damaged gastric architecture with dead neutrophils and pus formation

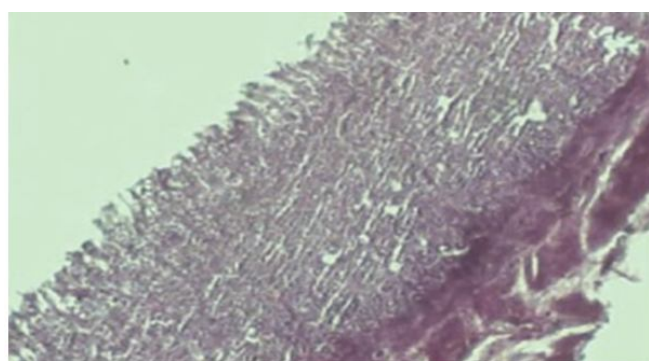


Fig-2: Photomicrograph of vehicle control group showing the normal gastric architecture

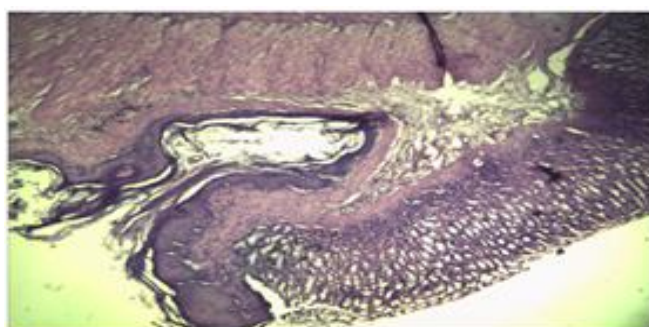


Fig - 3: Photomicrograph of Aspirin + petroleum ether extract of Beta vulgaris

Acute toxicity studies

There was no significant alteration in autonomic or behavioral responses in the rats treated with petroleum-ether extract of the roots of *Beta vulgaris*. No mortality was recorded in these animals up to 14 days. Thus the petroleum-ether extract was found to be non-toxic up to dose of 2g/kg body weight.

Histological examination of the gastric tissue

Histological examination revealed that, Aspirin control group shown extensive damage to gastric mucosa layer with edema and leucocytes infiltration of sub mucosal layer (Fig 1). Protection of gastric mucosa was better as seen by moderate disruption to the surface epithelium mucosa with moderate edema and leucocytes infiltration of the sub mucosal layer after pretreatment with 200 mg/kg of petroleum ether extract of *Beta vulgaris* (Fig 3).

DISCUSSION

The present study has been designed to evaluate the antiulcer activity of petroleum ether extract of *Beta vulgaris*. In acute toxicity testing no mortality was observed in rats even in a dose of 2g/kg of petroleum-ether extract of *Beta vulgaris* which indicates the safe nature of the extract.

Aspirin is a potent nonsteroidal anti-inflammatory drug (NSAID) that is used for the treatment of rheumatoid arthritis and related diseases as well as the prevention of cardiovascular thrombotic diseases. Gastric ulcer associated with the use of aspirin is a major problem. Many factors such as gastric acid and pepsin secretion, prostaglandin E2 (PGE2) content, NO synthase (NOS), oxidative damage, proinflammatory cytokines interleukin IL-1 and tumor necrosis factor (TNF) [7, 8] play important roles in the genesis of gastric mucosal damage, and its subsequent development. [9, 10] In the present study petroleum ether extract of *Beta vulgaris* showed a significant antiulcer activity.

Preliminary phytochemical investigation of petroleum ether extract revealed the presence of sterols, carbohydrates, tannins, phenols, glycosides and alkaloids. The antiulcer activity of extract is may be due to presence of phenols or steroids. This interesting observation indicates that the extracts can be potential source for the treatment of ulcer. However, detailed study like isolation of active molecule and characterization is required to confirm the phytochemical response for the activity.

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