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# ANTI-ULCER ACTIVITY OF *LEUCAS ASPERA SPRENG*

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***ABSTRACT:*** *The alcoholic extract of Leucas aspera (ALA) was investigated for its antiulcer effect by two experimental models. A significant reduction in acid secretion and ulcer score was observed in rats after ALA treatment. The observed antiulcer effect of ALA may be due to a combination of antisecretary effect and a protective effect on gastric mucosa.*

## INTRODUCTION

*Leucas aspera* (Labiatae) has been attributed with many medical properties in Indian system of Medicine. Its usefulness in scabies, cold, snake bite and in psoriasis have been documented (Nadkarni, 1954; Chopra et.al. 1956). Our earlier work revealed significant anti inflammatory (Kannappa Reddy et. al., 1986) and analgesic effect (unpublished observation) for the alcoholic extract of *Leucas aspera*. Verma (1981) has claimed that the juice from the leaves of *Leucas apera* was found to reduce the acidity and heals ulcer when taken in empty stomach.

In the present study, the effect of *Leucas aspera* on gastric secretion and ulcer was investigated in rats.

## MATERIALS AND METHODS

Preparation of alcoholic extract of *Leucas aspera* (ALA).

*Leucas aspera* was collected around Madras and dried under shade. The powdered whole plant material was extracted with 90% alcohol. The alcoholic extract was condensed and evaporated to dryness under vacuum and prepared as a suspension in distilled water. This was used for pharmacological testing. The extract (ALA) was administered (s.c) to rats in doses of 50, 100 and 200 mg/kg.

Male albino rats weighing 150 – 200 g were used in this study. Ulcer was induced in rats by two methods (i) Shay rat ulcer and (ii) aspirin induced ulcer.

(i) Shay rat ulcer (Shay et. Al., 1945) :

The animals were fasted for 24 h. before the experiment, but had free access to water. Under light either anesthesia, the abdomen was opened and the pylorus was ligated. The animals were treated with different doses of ALA or cimetidine 100 mg/kg (p.o)

60 min. prior to pyloric ligation. The animals were sacrificed 18th later and the stomach was opened along the greater curvature. The gastric contents were collected, the volume measured and centrifuged. Free acidity and total acidity were estimated by titrating against 0.01 N Sodium hydroxide, using Topffer's reagent and phenolphthalein as indicators respectively.

Ulcers were examined using a magnifying lens and scored according to the severity in arbitrary units (Bonny castle 1964).

O (Normal) – No ulcer

1 – Isolated haemorrhagic spots

2 – Dense haemorrhage

3 – Dense haemorrhagic spots and small ulcers

4 – Large ulcers

5 – Perforation

(ii) Aspirin induced ulcer (Hemmati 1973)

The rats were fasted for 24 h and aspirin (200 mg/kg; p.o) was administered. Animals were treated with 50, 100 or 200 mg/kg (s.c) of ALA, 60 min. prior to aspirin administration. The animals were sacrificed after 5 h, the stomach was taken out, examined for ulcers and scored according to the severity.

A minimum of six animals were included in each test group. All the results were analysed using Students 't' test.

## RESULTS

*i. Shah rat method:*

In this model cimetidine (100 mg/kg) treatment significantly reduced the volume of gastric secretion, the free and total acid, and also the ulcer score. ALA treatment significantly reduced the volume of gastric secretion and ulcer score at 200 mg/kg. There was significantly reduction in the Free and total acid with 100 and 200 mg/kg of ALA treatment (Table I).

*ii. Aspirin induced ulcer*

In this model ALA treatment (100 and 200 mg/kg) reduced the ulcer score significantly when compared to the vehicle treatment (Table 2).

## DISCUSSION

The results of the present study indicate that ALA has a potent antisecretory activity as observed by a significant reduction in volume of gastric secretion, free acid and total acid. The antiulcer effect of ALA is evident by a dose dependent reduction in the Ulcer score in Shay rats. This activity was further confirmed in aspirin induced ulcer model, where also a similar effect was observed.

It has been suggested that histamine plays a major role in the development of ulcers in the above models (Braquet et. al; 1987).

In our previous studies ALA has been shown to protect mast cells against degranulation (Reddy et. al., 1986) and thus inhibit the release of various mediators like histamine from mast cells. This effect on histaminergic system may be responsible for the reduction in gastric secretion and ulcer score observed after ALA treatment.

It will be interesting to note that ALA also possess significant anti inflammatory and analgesic activity. Generally compounds possessing analgesic and anti-inflammatory effect induce gastric ulceration. (eg. Aspirin). It is a rare phenomenon that a combination of analgesic, anti inflammatory and anti-ulcer effect are observed with leucas aspera.

**TABLE – I**

**Effect of ALA on gastric secretion, acidity and ulcer score in shay rats**

| Treatment (mg / kg; s.c) | Volume of Gastric secretion (ml) | Free acid @ (ml) | Total acid @ (ml) | Ulcer score |
|---|---|---|---|---|
| Vehicle | 8.5 ± 1.2 | 25.6 ± 1.3 | 60.7 ± 2.3 | 2.8 ± 0.3 |
| Cimetidine 100 | 4.1 ± 0.3 ** | 9.1 ± 0.5 *** | 20.3 ± 1.0 *** | 1.0 ± 0.1 *** |
| ALA – 50 | 8.1 ± 1.7 | 21.6 ± 1.3 | 56.3 ± 3.5 | 2.3 ± 0.2 |
| ALA – 100 | 7.6 ± 0.9 | 15.3 ± 1.7 *** | 37.3 ± 2.1 *** | 1.9 ± 0.3 |
| -200 | 5.3 ± 0.2* | 13.6 ± 1.2 *** | 36.0 ± 1.5 *** | 1.1 ± 0.2 *** |

@ Express in terms of volume of 0.1 N. NaOH required to neutralised 100 ml of gastric secretion.

* $P<0.05$; ** $P<0.01$ and ***$P<0.001$ as compared with vehicle treatment. Each value represents mean + SEM of six observations.

**TABLE – II**

**Effect of ALA on aspirin induced ulcer in rats**

| Treatment (mg / kg s.c) | Ulcer score |
|---|---|
| Vehicle | 3.3 ± 0.3 |
| ALA | |
| 50 | 3.10 ± 0.6 |
| 100 | 2.00 ± 0.4* |
| 200 | 1.50 ± 0.25** |

Each value represents the mean + SEM of six observations.

*P<0.05 and *** P<0.001 as compared with vehicle treatment.

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