

Evaluation of Anti-Ulcer Activity of *Arisaema Leschenaultii*

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Abstract

Ethanollic and Aqueous extract of *Arisaema Leschenaultii* was evaluated for its Antiulcer activity against naproxen induced ulcer. Different extracts of blume of *A. leschenaultii* gave dose dependent increase in anti-ulcer activity against naproxen induced ulcer. Ethanollic extract of blume of *A. leschenaultii* showed better ulcer inhibition (55.8%) as compared to AEAL (36.5%). The present investigation revealed that *Arisaema Leschenaultii* exhibited significant antiulcer activity by enhancing antioxidant potential of gastric mucosa thereby reducing mucosal damage.

Keywords: Antiulcer activity, Herbal drug, Antioxidant,

Introduction

Arisaema leschenaultii (B.) AL. (Family Araceae) is commonly known as Dhei or Cobra Lilly. It is widely distributed over the greater part of India on the hills of Assam, Karnataka, Kerala and Tamilnadu. Different parts of plant are traditionally used in Ayurveda for the treatment of urinary diseases, colitis, eczema, purging, gonorrhoea, piles, haemorrhoids, syphilis, roundworm, fistula

and sinus [1]. The whole plant of this species has been reported to show antiseptic property in buffaloes. Kumari et al., studied that AL is used as abortifacient and contraceptives for pig and cattle and also reported the 2 method of preparing contraceptives from this plant [2]. Satyanarayan reported the fructosans is present in AL [3].

Material and methods

Extraction Of Drug Material

Plant material of *A. leschenaultii* was collected from different regions, thoroughly washed, and dried at 55°C in an air dryer for 48 h. Dried plant parts were powdered with Wiley Mill (Model 4276-M, Thomas Scientific, USA) to pass 20 mesh sieve and stored in sealed plastic bags. About 200 g of powdered material was taken and extracted with different techniques of extraction (soxhlet extraction, percolation, maceration, sonication, homogenization and microwave extraction) using different solvents (petroleum ether, benzene, chloroform, acetone, ethanol, methanol and water). Each process was repeated thrice for complete extraction. After extraction, extracts were combined and evaporated to dryness in vacuo.

Anti-ulcer

The present study deals with anti-ulcer activity of *A. leschenaultii* extracts in naproxen induced ulcer. The experimental setup of the study was given below.

Experimental setup

Group 1: Control group (10 mL/kg/day of saline)

Group 2: Omeprazole (30 mg/kg p.o.)

Group 3: EEAL (100 mg/kg/day in 1% CMC, p.o.)

Group 4: EEAL (200 mg/kg/day in 1% CMC, p.o.)

Group 5: AEAL (100 mg/kg/day in 1% CMC, p.o.)

Group 6: AEAL (200 mg/kg/day in 1% CMC, p.o.)

Naproxen induced ulcer

One hour after drug treatment gastric ulcer was induced by the modified procedure [4]. Control was administered with 10 mL/kg of normal saline. Ethanollic and aqueous extracts (100 and 200 mg/kg) were given to test groups. Omeprazole (30 mg/kg p.o.) was used as standard. One hour later naproxen (30 mg/kg p.o.) was administered. Animals were sacrificed after six hours of naproxen administration, stomach was isolated and opened along greater curvature to expose inner surface. Inner surface was washed thoroughly with normal saline. The ulcer area, ulcer index and percentage inhibition were calculated by using image analysis software [5].

Result and discussion

Anti-ulcer activity

The present study deals with anti-ulcer activity of *A. leschenaultii* extracts in naproxen induced ulcer. Naproxen is a non-steroidal anti-inflammatory drug (NSAID), which can directly damage the gastric epithelium by intracellular accumulation of drug in an ionised state and reduce the hydrophobicity of the mucus gel layer by changing the action of surface active phospholipids [6]. The

enzymes such as catalase and glutathione peroxidase provide defence against damage of gastric mucosa after administration of NSAIDs and also decrease lipid peroxide level in rats [7 & 5]. The ethanolic extracts of *A. leschenaultii* reduced lipid peroxide level by scavenging free radical and might increase the activity of anti-oxidant enzymes (catalase and glutathione peroxidase).

Neutrophil adherence to the endothelium of gastric microcirculation is critical in NSAID injury [8]. Neutrophil adherence damages the mucosa by liberating oxygen free radicals, releasing proteases and obstructing capillary blood flow. NSAIDs might induce the synthesis of tumour necrosis factor (TNF) and leukotrienes and these inflammatory mediators stimulate neutrophil adherence by up-regulation of adhesion molecules [9, 10 & 11]. The free radical scavenging effect, anti-TNF activity, prostaglandins like protective action and leukotrienes inhibition by *A. leschenaultii* extracts might reverse the effect of neutrophil adherence.

Gastric acid probably exacerbates NSAID injury by disrupting the basement membrane to produce deep injury, affecting platelet aggregation and impairing ulcer healing [12, 13 & 14]. Ethanolic

extracts of *A. leschenaultii* is effective against first phase of inflammation, which occurs due to the release of histamine, serotonin and kinins. Thus, *A. leschenaultii* might reduce the secretion of gastric acid by blocking histamine receptor.

Ulcer healing is a complex process that involves combination of wound retraction and re-epithelialization. It also involves growth factors and angiogenesis [15]. *A. leschenaultii* significantly reduced the size of ulcer.

Table 1 shows the effect of *A. leschenaultii* extracts on naproxen induced ulcer. Our result showed that different extract of blume of *A. leschenaultii* gave dose dependent increase in anti-ulcer activity against naproxen induced ulcer. Ethanolic extract of blume of *A. leschenaultii* showed better ulcer inhibition (55.8%) as compared to AEAL (36.5%). The results were significant as compared to control ($P < 0.05$).

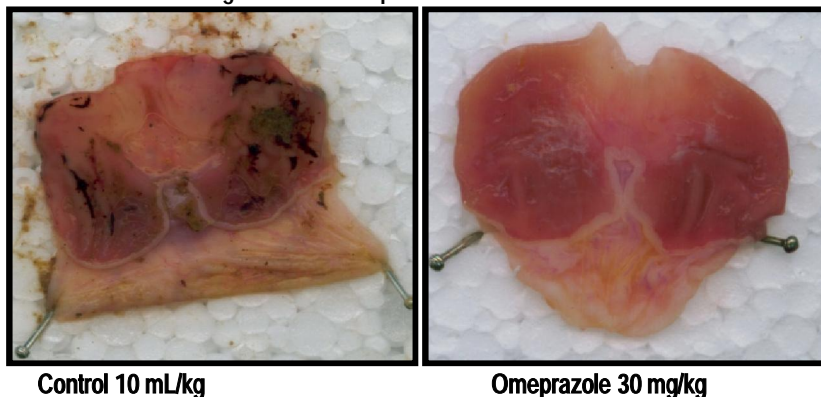
The anti-ulcer activity of *A. leschenaultii* extracts might be due to antioxidant, anti-secretory, protective action and leukotrienes inhibition. The morphological representation of anti-ulcer activity of different extracts of *A. leschenaultii* is presented in Figure 1.

Table 1: Effect of *A. leschenaultii* blume extracts on naproxen induced ulcer.

Groups	Dose (mg/kg)	US (mm ²)	UI	% I
Con	-	7.34±0.22	1.23±0.04	-
Omeprazole	30	2.54±0.09**	0.37±0.01**	80.90
EEAL	100	4.72±0.01**	0.73±0.01**	44.20
	200	4.05±0.52**	0.66±0.08*	55.80
AEAL	100	5.87±0.12	0.95±0.02*	31.10
	200	5.36±0.13**	0.88±0.06*	36.50

US: Ulcer surface; UI: Ulcer index; % I: Percent inhibition.

All values are expressed as mean ± SEM (n=6); One-way ANOVA followed by Dunnett's test; * $P < 0.05$ and ** $P < 0.01$ considered significant as compared to control.



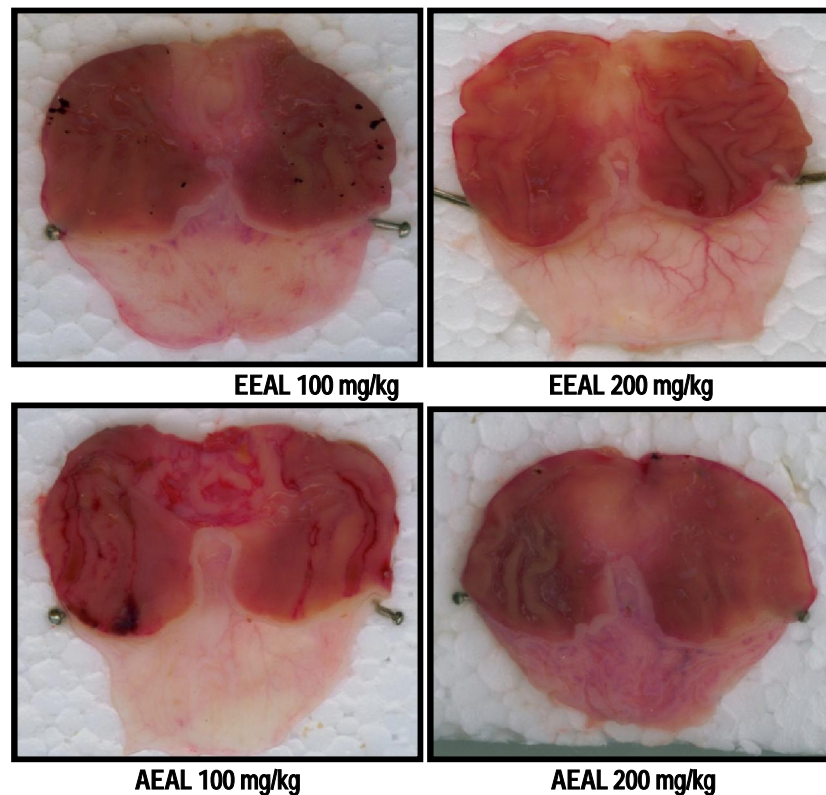


Figure 1: Morphological representation of anti-ulcer activity of *A. leschenaultii*.

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