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Evaluation of Anti Ulcer effect of Polyalthia Longifolia Leaves in Albino Rats

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ABSTRACT

The anti ulcer activity of Polyalthia longifolia has been carried out in albino rats. Antiulcer activity of ethanolic extract of leaves was studied in rats, in which gastric ulcers were induced by oral administration of indomethacine (20 mg/kg). The extract was administered in the dose of 100 mg and 200 mg/kg to the test group of animals for three consecutive days. The rats were subjected for ulcer index and gastric acid evaluation. The reduction of ulcer index as well as gastric acid output in extract treated animals was found to be statistically significant with respect to control animals. The extract exhibited ulcer protection activity in dose dependant manner.

Keywords: *Polyalthia longifolia*, anti ulcer, indomethacine induced ulcer, ulcer index.

ARTICLE INFO

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1. Introduction

A retrospection of healing power of plants, a return to natural remedies is absolute need of our time. Medicine of plant origin is based upon the premise that plants contain natural substances that can promote health and alleviate illness [1]. The present study supports the same for a folkloric herb *polyalthia longifolia* which is commonly used to alleviate the abdominal discomforts mainly stomach ulceration. Stomach ulcer is among the major disease of

GIT, for which a large number of traditional and modern medicines are being utilized. Among these, the medicines of plant origin are more popular because of their less adverse effect [1]. Present study is based on the anti-ulcer activity of plant *polyalthia longifolia* of family Annonaceae.

2. Materials and Methods

Plant Material

The leaves of *polyalthia longifolia* were collected from Anantapur, A.P (India). The plant was authenticated; leaves were dried, powdered and extracted.

Animal

Albino rats (150-200 g) and albino mice (25-30 g) were used. Animals were obtained from the animal house after acclimatization and experiments were carried out in accordance With CPCSEA guide lines [2]. The study was approved by Institutional Animal Ethics Committee. (878/ac/05/CPCSEA/004/2011).

Acute toxicity study

Albino mice of either sex weighing 20-25 g were utilized for the acute toxicity studies [3]. The dose of 200 mg/kg body weight did not produce any toxic effect.

Anti ulcerogenic activity

Indomethacin induced gastric ulceration model was used for the production of gastric ulceration [4]. The animals were divided into four groups (control, standard, extract 100 mg, extract 200 mg) of 6 rats in each group weighing 150-200 g. The oral suspension of Indomethacin (20 mg/kg suspension in 1% CMC) was taken as ulcerogenic drug for all groups. The control group was treated with the Indomethacin for 3 consecutive days. The standard groups were treated with an ulcer preventive drug misoprostol (100 mcg/kg i.p.) just one hour after Indomethacin treatment daily for 3 consecutive days. In a similar manner the extract dose 100 mg and 200 mg per kg body weight were also given to the test group of animals one hour after the Indomethacin treatment for 3 consecutive days. Rats were sacrificed and abdomen was opened through a mid-line incision. Gastric juice was collected after separating the

stomach by surgery for the determination of total acid output. The stomach was opened through greater curvature and washed slowly under tap water to score the ulcer. The ulcers were scored as below

0=Normal coloured stomach

0.5=Red colouration

1.0=Spot ulcers

1.5=Hemorrhagic streaks

2.0=Ulcers 3 5

3.0=Ulcer > 5

Mean ulcer score for each group of animals was expressed as ulcer index [5]. The number of ulcer per stomach was also recorded and the percent of ulcer incidence of each group was compared with the control. Determination of total gastric output to determine the gastric output, the whole stomach content of the treated animal was removed in a centrifuge tube. The gastric content was centrifuged at 1000 rpm for 10 minutes. 1 ml of supernatant was taken and diluted with 9 ml of distilled water and titration was carried out against pre-standardized sodium hydroxide (0.01 N) using Topfor's reagent (dimethyl-amino-azobenzene with phenolphthalein) as indicator. The first end point was recorded when the solution turned to orange colour. The volume of sodium hydroxide needed was taken as corresponding to the free acid. Titration was further continued till the solution regained pink colour. The volume of sodium hydroxide required was noted and taken as corresponding to the total acid.

Acid strength (in m eq/L) = Volume of NaOH x Normality x 100/0.1

The comparison among test, control and standard groups was done in tabular manner.

3. Results and Discussion

It is evident from the Table 1, Table 2 that the ethanolic extract of the plant exhibited anti-ulcer activity in dose dependent manner. The treatment of rats with the ethanolic extract (100 and 200 mg/kg) produced a significant reduction in acid output as it is evident from Table 2. The

protection was statistically significant even at 100 mg/kg dose also. Thus, results tend to confirm that the ethanolic extract of the *polyalthia longifolia* has a preventive role in drug induced ulceration.

Table 1: Effect of extract against Indomethacin induced gastric ulcer (ulcer index) in rats

Treatment	Average ulcer index±SEM
Control (Vehicle + Indomethacin)	3.89 ± 0.43
Standard (Misoprostol+ Indomethacin)	0.41 ± 0.25**
Extract (100 mg/kg + Indomethacin)	2.72 ± 0.34*
Extract (200 mg/kg + Indomethacin)	1.62 ± 0.19**

Values are Mean ± SEM; n=6 animals in each group. *P<0.05 and **P<0.01 When compared to control (by using one way ANOVA with Dunnett t-test)

Table 2: Effect of extract against Indomethacin induced gastric ulcer (free and total acid) in rats

Design of Treatment	Free acid (m eq / L)	Total Acid (m eq/L)
Control (Vehicle+Indomethacin)	50.82 ± 3.35	68.83 ± 1.73
Standard (Misoprostol+Indomethacin)	20.50 ± 1.4**	23.45 ± 0.98**
Extract (100 mg/kg + Indomethacin)	44.87 ± 2.87*	55.38 ± 1.56*
Extract (200 mg/kg + Indomethacin)	28.89 ± 2.12**	57.19 ± 1.75**
n = 6 animals in each group; values are Mean ± SEM; * p<0.05, ** p < 0.01 When compared to control (by using one way ANOVA with Dunnett t- test)		

Discussion

The peptic ulcer is produced because of the disturbance in the protection of stomach mucosa against gastric HCl. Risk of ulcer genesis is increased due to exposure of man to many noxious agents and chemicals. Many drugs available in the market greatly reduce the morbidity and mortality, but may have the adverse reactions like reduction in

Prostaglandin synthesis by inhibiting the cyclo-oxygenase. In this study, the anti-ulcer activity of *Polyalthia longifolia* was explored with the help of pharmacological experiments and statistical analysis. The extract produced a dose dependant protection against indomethacin induced peptic ulcer though not better than misoprostol.

4. Conclusion

The extract produced a dose dependant protection against indomethacin induced peptic ulcer though not better than

misoprostol. However, to establish its mode of action, several studies evaluation can be done in future.

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