The Effect of *Aglaia Roxburghiana* (W.& A.) Miq. Var. *Beddomei* on Experimentally-Induced Ulcers

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The ethanolic extracts of aerial parts and fruits of *Aglaia roxburghiana* were tested in rats for their effect on gastric secretion and ulcer formation in Shay rats and aspirin-induced ulcer model. Doses ranging from 100 to 400 mg/kg of the extracts were used in the experiment. The fruit extract produced a dose-dependent reduction of the free acidity whereas, a significant reduction in ulcer score was observed for both aerial part and fruit extracts. Both the extracts also offered significant protection against aspirin-induced ulcers. Histopathological observations support the ulcer protective effect of *Aglaia roxburghiana*. The present results agree with the use of *Aglaia roxburghiana* in traditional medicine against gastric ulceration.

AGLAIA roxburghiana Miq. Var. *beddomei* (Meliaceae) a tree found in Andhra Pradesh, Tamilnadu, Karnataka, and Kerala[1] is a source drug for Priyangu[2]. It is claimed to be beneficial in varied conditions such as inflammation, febrile complaints, gastric ulcers, leprosy, dysentery, throat infections, skin diseases and painful micturition[3,4,5].

Further, potent antiinflammatory effect has observed with *Aglaia roxburghiana* extracts in experimental animals in our laboratory (unpublished observation). One of the major limitations of antiinflammatory agents is their ulcerogenic potential, hence, it was of interest to study their influence on gastric mucosa. Accordingly to understand the relative tolerability and therapeutic potential in the present study, the ethanolic extract of aerial parts and fruits of *Aglaia roxburghiana* have been investigated for their effect on gastric secretion and ulcer formation in pylorus-ligated rats (Shay rats) and aspirin-induced ulcer model.

Aglaia roxburghiana aerial part and fruits were freshly collected, shade dried, coarsely powdered and extracted in 90% ethanol by cold percolation method. The solvent was removed by distillation on a waterbath at atmospheric pressure and the last traces were removed under vacuum. Since the extracts were insoluble in water, a uniform suspension was made in 1% carboxymethyl cellulose. Animals received this suspension s.c. in doses of 100, 200 or 400 mg/kg. The control animals received the vehicle.

Adult male albino rats (130-150 g) were selected and ulcers were induced as described by Shay *et al*[6]. The animals were treated with ethanolic extract of aerial part or fruit 30 min prior to pyloric ligation. A separate group of animals received ranitidine, 100 mg/kg (p.o.) 60 min prior to pyloric ligation. The animals were sacrificed 18 h later, the volume, free and total acidity of gastric contents were examined. The gastric ulcers were examined and scored visually according to severity in arbitary units ranging from 0-5. They were also subjected to histopathological examination.

Adult male albino rats (130-150 g) fasted for 24 h were given aspirin 200 mg/kg orally[7]. Ethanolic extract of aerial part or fruits of *Aglaia roxburghiana* was administered s.c. 30 min prior to aspirin administration. The animals were sacrificed 5 h later, the stomach was taken out and the ulcers were scored visually as described earlier. They were

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Table-1 : Effect of *Aglaia roxburghiana* in Shay Rat Model

No	Treatment (mg/kg)	Volume (ml)	# Free acidity	# Total acidity	Ulcer score
1.	Vehicle	8.48 ± 0.48	2.10 ± 0.37	4.6 ± 0.08	2.83 ± 0.46
2.	Ranitidine 100	6.51 ± 0.51*	1.0 ± 0.02*	0.6 ± 0.20*	0.33 ± 0.20*
	AP extract				
3.	100	3.83 ± 0.30*	1.33 ± 0.11	5.35 ± 0.22	2.00 ± 0.35
4.	200	3.25 ± 0.28*	1.36 ± 0.30	4.70 ± 0.73	1.50 ± 0.41*
5.	400	1.95 ± 0.16*	0.91 ± 0.13*	3.70 ± 0.48	0.33 ± 0.51*
	FR extract				
6.	100	7.30 ± 0.74	1.15 ± 0.05*	2.70 ± 0.17*	0.16 ± 0.16*
7.	200	7.76 ± 0.76	1.18 ± 0.01*	2.35 ± 0.10*	0.0 ± 0.0*
8.	400	7.50 ± 1.08	1.2 ± 0.03*	2.35 ± 0.04*	0.0 ± 0.0*

Each value represents the mean ± SEM of 6 of observations.
* $p \leq 0.05$(Dunett's)
# Free and Total acidity expressed as the volume of 0.01 N NaOH required to neutralise 1 ml of gastric juice.

also subjected to histopathological examination. The results were subjected to statistical analysis by ANOVA followed by Dunnett's test (Student 't' test was performed for gastric ulcer score), and a level of significance of $P \leq 0.05$ was chosen.

Pretreatment with ranitidine, a potent histamine (H_2) receptor antagonist significantly reduced the volume of gastric secretion, free and total acidity and also the ulcer score compared to vehicle treatment in pylorus-ligated rats. Pretreatment with ethanolic extract of *Aglaia roxburghiana* aerial part significantly reduced the volume of gastric acid secretion in all doses tested. However, the fruit extract did not alter the volume. The free and total acidity were reduced in the fruit extract pretreated animals significantly compared to vehicle treatment. Treatment with aerial portion did not alter the total acidity but reduced the free acidity to a significant level at a dose of 400 mg/kg. A graded reduction in ulcer score was observed by pretreatment with different doses of aerial part and fruit extracts. The reduction in ulcer score produced by fruit extract was more than that with aerial part and comparable to that of ranitidine (Table-1). Aspirin-induced ulcers were protected by extracts of aerial parts and fruits at all doses tested (Table-2).

In untreated Shay rats, the stomach showed extensive ulceration, intense mixed inflammatory cell infiltration, oedema and congested blood vessels. Whereas, aerial part and fruit extract, at 100 and 200 mg/kg showed only mild congestion and very minimal inflammatory cell infiltration. Similarly fruit extract at 100 mg/kg showed mild congestion and very minimal inflammatory cell infiltration. Aerial part and fruit extract at 400 mg/kg showed no significant pathological changes. The histological examination of rat stomach after aspirin treatment revealed severe inflammation with ulceration. But in *Aglaia roxburghiana* aerial parts and fruit extract-treated animals only mild mixed inflammatory cell infiltration in the mucosa and submucosa was observed at all the doses tested.

The results reveal that the ethanolic extracts of aerial parts and fruits of *Aglaia roxburghiana* have antiulcerogenic effect as evidenced by reduced free acidity and ulcer scores. It is interesting to note that the effect observed in Shay rats with the fruit extracts is comparable to that of ranitidine. Even though aerial parts did not change the free and total acidity in low doses, a significant reduction in free acidity was observed with 400 mg/kg dose. This suggests that the extract of aerial part may have a direct

Table-2 : Effect of *Aglaia Roxburghiana* on Aspirin induced ulcer

Treatment (mg/kg)	Ulcer score
Aspirin (p.o.)	
200	1.83 ± 0.35
AP extract (s.c.)	
100	0.67 ± 0.20*
200	0.50 ± 0.20*
400	0.50 ± 0.20*
FR extract (s.c.)	
100	1.00 ± 0.32
200	0.67 ± 0.32*
400	0.16 ± 0.16*

* $p \leq 0.05$ compared with vehicle treatment (Students 't' test)

Each value represents the mean ±SEM of 6 observations.

protective effect against ulcer formation which is confirmed by the reduction in ulcer score in aspirin-induced ulcer model also. Thus a combination of antisecretory and ulcer protective effect of *Aglaia roxburghiana* may be responsible for the antiulcer activity observed in the present study. Histopathological studies are in support of this observation. The pathological changes induced by pyloric ligation and aspirin administration are reversed by treatment with the ethanolic extract of aerial parts and fruits of the plant. The present observations support the traditional claim for the usefulness of *Aglaia roxburghiana* in gastric ulceration.

Incidentally, *Aglaia roxburghiana* extracts were found to have potent antiinflammatory activity (unpublished observation). Absence of gastric irritation and protection against ulceration are two important features of *Aglaia roxburghiana* which distinguishes it from other conventional antiinflammatory agents. It will be worthwhile to identify the active constituents responsible for the ulcer protective property of *Aglaia roxburghiana*.

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