

THE PHARMA INNOVATION

Anti-Ulcer Activity of *Sechium Edule* Ethanolic Fruit Extract

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Treatment with ethanolic extract of *sechium edule* fruit at a dose of 500mg/kg p.o significantly protected the ulceration induced by aspirin. *Sechium edule* fruit at a dose of 500mg/kg body weight p.o. significantly reduced total acidity, free acidity, gastric output and increases the PH of gastric secretion.

Keyword: *Sechium Edule*, Pylorus Ligation, Ethanol, Ulcer Index, Free Acidity, Total Acidity, Mucosal Epithelial.

1. Introduction:

Peptic ulcer disease is ulceration of mucous membrane penetrating through the muscularis mucosa and occurring in areas bathed by acid and pepsin in stomach and duodenum. If ulceration occurs in stomach it is known as gastric ulcers and when in the duodenum, it is named as duodenal ulcers. Peptic ulcer disease is a common medical emergency with an annual incidence of approximately 100 per 100,000 adults and an overall mortality of 10 to 15% in recent studies. In about two third of cases, the bleeding sources are acid related lesions^[1].

Peptic ulcer therapy had undergone many studies over past few years and a number of synthetic drugs are now available for treatment. Reports on clinical evaluation of these drugs shows that there are incidence of relapses and adverse effects and danger of drug interactions during ulcer therapy. Hence the search for an ideal anti-ulcer drug continues and has also been extended to herbal drugs in search for new novel molecule which

affords better protection and decreases the incidence of relapse.

The plant products are becoming more popular than the synthetic drugs due to its low toxicity and effectiveness. According to recent survey, herbal therapy or use of natural products other than vitamins and minerals, was the most commonly used complementary and alternative medicines (CAM) therapy (18.96%)^[2].

This is mainly attributed due to their long standing experience of exposure of these drugs in ethnic medicine system of Ayurvedha.

Flavonoids exhibit several biological effects like anti-inflammatory, hepatoprotective and anti-ulcer actions. Some recent reports have been indicated that many flavonoids possess anti-ulcerogenic activity such as quercetin, kampferol and rutin. Already several scientific papers have been published related to anti-ulcer activity from medicinal plants but still numbers of plants have been screened for their efficacy. *Sechium edule* (Linn) R.Br is one of such plants the fruits of

which are rich in flavonoids, such as flavonol, aglycone, flavonol glycosides etc..

2. Materials and Methods

2.1 Materials:

Omeprazole(8mg/kg p.o), Sechium edule ethanolic extract(500mg/kg p.o), Aspirin, Alcohol, Anesthetic chloroform, Saline.

2.1.1 Preparation of extract:

The fruits of Sechium edule were collected and shade dried. The dried fruits were coarse powdered and extraction was done using ethanol as solvent.

The extract was concentrated under reduced pressure the dried extract was stored and in a air tight container in a refrigerator below 10°C. the solution of ethanolic extract was prepared and using distilled water for evaluating anti-ulcer activity aspirin induced gastric ulcer method.

2.2 Evaluation of anti-ulcer activity:

2.2.1 Aspirin induced gastric ulcer method:

Procedure:In this method, female albino rats (wistar strain) weighing 150-200 gms were fasted in individual cages for 24 hrs care was being taken to avoid corprophagy.

- Group -I control (vehicle)
- Group-II standard (omeprazole 8mg/kg p.o)
- Group-III ethanolic extract of Sechium edule fruit (500mg/kg p.o)

Thirty minutes after the Sechium edule(or) reference (or) the control vehicle treatment, aspirin was orally administered to each rat according to body weight, after 4 hours the rats were euthanized with excess of anesthetic chloroform and stomach was cut open along the greater curvature ,cleaned of residual matter with saline and the inner surface was examined for ulceration.

The number of ulcers per stomach was noted and severity of the ulcers scored microscopically with the help of hand lens (10x) and scoring was done as per kulkarni (1987).

- 0= normal stomach.
- 0.5= red coloration.
- 1= spot ulcers.
- 1.5= hemorrhagic streaks.
- 2= ulcers>3mmbut<5mm.
- 3=ulcers>5mm.
- Percentage protection= $100 - \left[\frac{ut}{uc} \times 100 \right]$

Mean ulcer score for each animal is expressed as ulcer index. The percentage protection was calculated using the formula.

Where,

Ut=ulcer index for treated group

Uc=ulcer index for control group

2.3 Toxicity Studies:

2.3.1 Acute Toxicity Studies:

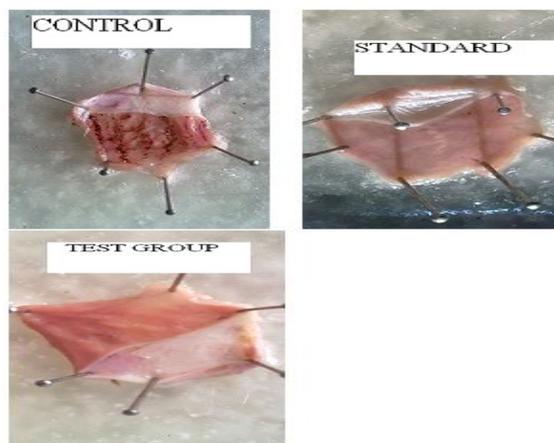
Swiss albino mice of either sex weighing 20-25 gms were utilized for the Ld₅₀ value determination. The method of miller and tainter was used for the experiments. The purified form of the ethanolic extract was used for the Ld₅₀ determination. Probit values against log doses were plotted and the value which corresponded to probit 5 was read as Ld₅₀. The minimum dose of 200mg/kg body weight did not produce any toxic effect and maximum of 500mg/kg produce desirable effects.

3. Results

3.1 Aspirin induced ulcers in rats:

The results of current study showed that pretreated rats with ethanolic extract of Sechium edule fruits at a dose of 500mg/kg weight significantly reduces the formation of gastric ulcers induced by aspirin compared to control group and the percentage of gastric protection when compared to control was 79.53%. Statistical analysis was carried out using analysis of variance (ANOVAs). The result were significantly if $p < 0.001$ vs control.

Effect of ethanolic extract of Sechium edule fruit on aspirin induced gastric ulceration in rats.



4. Discussion

The *Sechium edule* (linn) R.Br plant was found to be rich in phytochemical constituents which may have a variety of pharmacological actions. In literature survey the phytochemical investigations

made on this plant reported the presence of phytochemicals like flavonoids, aminoacids.etc The result of present study indicate that ethanolic extract of *Sechium edule* fruits exhibited

Table: 3 Phytochemical investigation

S.NO	TEST	RESULT
1.	Carbohydrates	Positive
2.	Alkaloids	Positive
3.	Glycosides	Positive
4.	Tannins	Positive
5.	Steroids	Negative
6.	Flavonoids	Positive

Table4:Effect of ethanolic extract of *Sechium edule* fruit on aspirin induced gastric ulcer in rats

Group no.	Body Wt. gms	Treatment	Ulcer Index						Total score	Mean ulcer Index \pm SEM	% Protection
			Normal colored stomach	Red coloration	Spot ulcers	Hemorrhagic streaks	Ulcers 3 but 5	Ulcers >5			
I	160	Control	-	0.5	1.0	1.5	2.0	-	5	6.500 \pm 0.670	-
	180		-	0.5	1.0	1.5	2.0	3.0	8		
	165		-	0.5	1.0	1.5	2.0	-	5		
	200		-	0.5	1.0	1.5	2.0	3.0	8		
	180		-	0.5	1.0	1.5	2.0	-	5		
	155		-	0.5	1.0	1.5	2.0	3.0	8		
II	175	Omeprazole (8mg/kg)	-	0.5	-	-	-	-	0.5	0.66 \pm 0.277** *	89.24
	190		-	-	-	-	-	-	0		
	180		-	0.5	1.0	-	-	-	1.5		
	205		-	-	-	-	-	-	0		
	155		-	0.5	-	-	-	-	0.5		
	155		-	0.5	1.0	-	-	-	1.5		
III	155	Ethanolic extract 500mg/kg	-	0.5	-	-	-	-	0.5	1.33 \pm 0.42***	79.53
	180		-	0.5	1.0	-	-	-	1.5		
	160		-	0.5	1.0	-	-	-	1.5		
	170		-	0.5	-	-	-	-	1.5		
	205		-	0.5	1.0	1.5	-	-	3.0		
	150		-	-	-	-	-	-	0		

Whereas p*** = p<0.001 is significant

significant anti-ulcer activity against aspirin induced gastric ulcer models.

Whereas in aspirin induced gastric ulceration it protect the rats gastric mucosa against hemorrhagic lesions produced by aspirin thus causing a significant decrease in ulcer index when compared to control group.

5. Conclusion

It was concluded that ethanolic extract of *Sechium edule* fruit showed significant anti-ulcer activity in aspirin induced gastric ulceration in rats.

In alcohol induced ulcer model ethanolic extract of *Sechium edule* fruits at a dose of 500mg/kg body weight p.o was found to exhibit significant cytoprotective action when compared to control (vehicle) group using omeprazole 8mg/kg p.o as a standard drug.

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