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### In vitro Antihistaminic Activity of hydro-alcoholic extract of *Sida acuta* Burm

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#### ABSTRACT

*Sida acuta* is a shrub indigenous to pantropical areas, widely distributed in regions and found in pastures, waste lands, cultivated lands, roadsides, lawns and planted forests. *Sida acuta* is ethanomedically used as treatment of diuretic, asthma, fever, headache, cough, cold, ulcer, anthelmintic, snake bite, urinary disease, female disorders, sedative, eczema, kidney stone, elephantiasis, testicular swelling, poultice for dandruff, rheumatic affections, facial paralysis, pulmonary tuberculosis and gonorrhoea. The phytochemical screening revealed the presence of tannin, saponin, flavonoid, terpenoids, cardio glycoside, vitamin composition and minerals composition was calcium, magnesium, zinc, steroids, phenolic compounds, sesquiterpene, alkaloid cryptolepine, quindoline, quindolinone and fixed oil. The hydro-alcoholic extract of *Sida acuta* was for its antihistaminic studies by using guinea pig ileum and tracheae. The percentage inhibition of hydro-alcoholic extract of *Sida acuta* (100µg/ml) on histamine induced contraction showed 60.6% in comparison with chlorpheniramine (1µg/ml) 69.69%. The present research study draws the conclusion that hydro-alcoholic extract of *Sida acuta* showed moderate antihistaminic effect which may be due the combined nature phytoconstituents.

**Keywords:** Chlorpheniramine maleate, Histamine, Malvaceae, *Sida acuta*

#### INTRODUCTION

*Sida acuta* is shrub indigenous to pantropical areas, weed is frequently found in pastures, waste lands, cultivated lands, roadsides, lawns and planted forests.

*Sida acuta* used in ayurvedic preparation as diuretic, sedative, abortifacient for the treatment of, asthma, fever, headache, cough, cold, ulcer, anthelmintic, snake bite, urinary disease, female disorders, [1] eczema, kidney stone, elephantiasis,

testicular swelling, poultice for dandruff, rheumatic affections, azoospermia, oligospermia, spermatorrhea, leucorrhoea, wounds, sciatica, nervous and heart disease, facial paralysis, pulmonary tuberculosis, gonorrhoea [2-5].

The literature survey of the plant revealed the presence of tannin, saponin, flavonoid, terpenoids, cardio glycoside, vitamin composition was thiamine, niacin, ascorbic acid, tocopherol, riboflavin and mineral composition was calcium, magnesium, zinc, steroids (ecdysterone, β-

sistosterol, ampesterol), phenolic compounds (evofolin-A and B, scopoletin, loliolid and 4-ketopinosesin, polyphenol, sesquiterpene<sup>7</sup>, alkaloid cryptolepine, quindoline and quindolinone and fixed oil [6-9].

The plant exhibited various pharmacological activities such as antibacterial [10], antimicrobial [11], larvicidal and repellent [12], gastric anti-ulcer [13], insecticidal [14], hypoglycemic [15], anti-pyretic [16], anthelmintic [17], antioxidant and thrombolytic [18], electrolytes and organ function parameters [19], diuretic and anti-urolithiatic [20], invitro stability and aggregatory [21], anti-inflammatory [22], alpha amylase Inhibitory [23], hepatoprotective [24], calcium oxalate crystal growth inhibitory [25], corrosion inhibitory [26], antiplasmodial [27], analgesis [28], anti-venom [29], anti-malarial [30], anti-ulcer [31], wound healing [32], cytotoxicity [33], cardiovascular [34], antifungal [35], anticancer [36].

The modern medicine causes chronic trouble sleeping, constipation, dry mouth, drowsiness, confused, depression and nervous so this study was aspire to investigate invitro antihistaminic effect for this plant.

## MATERIALS AND METHODS

### Plant collection & authentication

Fresh leaf of *Sida acuta* Burm were collected from the komanampatty village Dindigul (Dist), (Tamil Nadu) during the month of August-2017 was authenticated by DR. D.Stephen, M.Sc., Ph.D., Assistant Professor, Department of Botany, American College, Madurai-20. The herbarium of this specimen was kept in the department for further references

### PREPARATION OF HYDRO-ALCOHOLIC EXTRACT OF *SIDA ACUTA* BURM. (HAESA)

#### Procedure

The shade dried and coarsely powdered leaf of *Sida acuta* Burm. (Leaf) was defatted with petroleum ether (60-80°C). The residue was dried and extracted with hydro-alcohol (70%) by maceration until the complete extract of the material and filtered. The extract was concentrated

under reduced pressure to obtain a solid residue (dark brown).

## IN VITRO ANTI-HISTAMINIC ACTIVITY

### Determination of anti-histaminic activity of HAESA

The guinea pigs procured from the animal house, K.M. College of Pharmacy, Madurai. The animals were treated with animal feed and water exposed to 12h dark and light. The study was approved as per CPCSEA guidelines and was given ethical clearance by the college ethical committee no KMCP/17/18 dated 11/03/18.

Hydro-alcoholic extract of *Sida acuta* was subjected to in-vitro antioxidant studies. It includes guinea pig ileum and guinea pig tracheal method.

### GUINEA PIG ILEUM AND TRACHEA PREPARATION

The guinea pig ileum and trachea were prepared and hydro-alcoholic extract of *Sida acuta* were administered as per (Kulkarni 2003 and Goyal 2007) [37-38]

### PROCEDURE

Guinea pigs of either sex (1 to 1.5 kg), starved overnight but allowed free access to water, were used. The animals were killed by a blow on the head and were emarginated. A segment of the guinea pig ileum (approximately 2cm long), removed from a freshly killed animal, was tied with a thread to the top and bottom ends without closing the lumens. It was suspended in the same way in a 30 ml organ bath containing tyrode and krebs solution separately for guinea pig ileum and trachea respectively maintained at  $37 \pm 1^\circ\text{C}$  and gassed with air. A tension of 0.5 g was applied and the tissue was allowed to equilibrate for the period of 30 min before adding any extract or drugs to the organ bath. Contractile responses were established for histamine and concentrations were recorded depending on the responses due to 10 µg/ml histamine using writing lever. The effects of the 500, and 1000µg/ml hydro alcoholic extract of *Sida acuta* on the histamine-induced contraction were investigated. Contact times of 30 s and 5 min time

cycle were maintained for proper recording of the responses.

The results are tabulated in **Table:** 1 and 2 and displayed in **Figure:** 1,2,3,4,5,and 6

### EXPERIMENTAL DESIGN

- Group 1 received normal saline and Histamine 10µg/ml
- Group 2 received Histamine 10µg/ml and Hydro alcoholic extract of *Sida acuta* 500µg/ml
- Group 3 Histamine 10µg/ml and Hydro-alcoholic extract of *Sida acuta* 1000µg/ml
- Group 4 Histamine 10µg/ml and Chlorpheniramine maleate 10µg/ml

### RESULT AND DISCUSSION

#### Determination of antihistaminic activity of hydro alcoholic extract of *Sida Acuta burm* (leaves) (HAESA) by guinea pig ileum

The antihistaminic effect determined for the hydro-alcoholic extract of *Sida acuta* Burm as per (Kulkarni 2003 and Goyal 2007) [37-38]

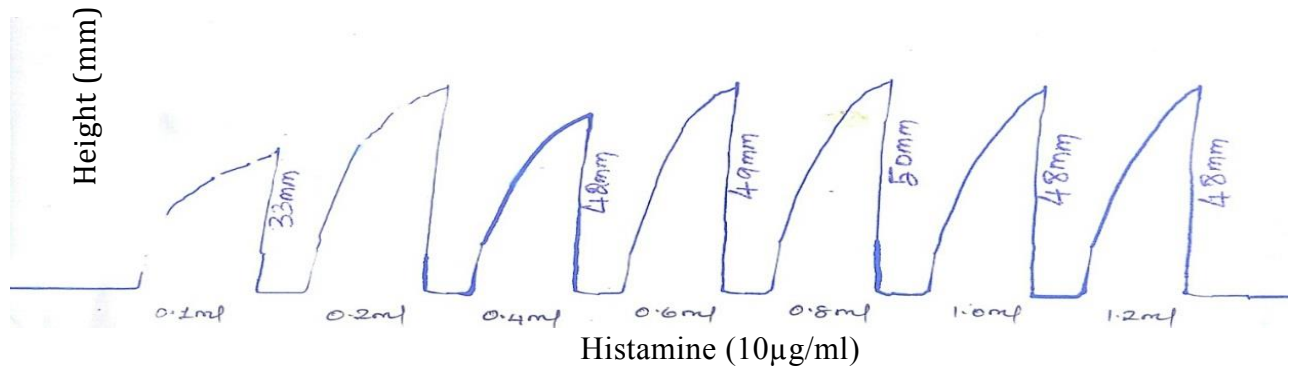


Figure: 1 DRC of histamine in guinea pig ileum

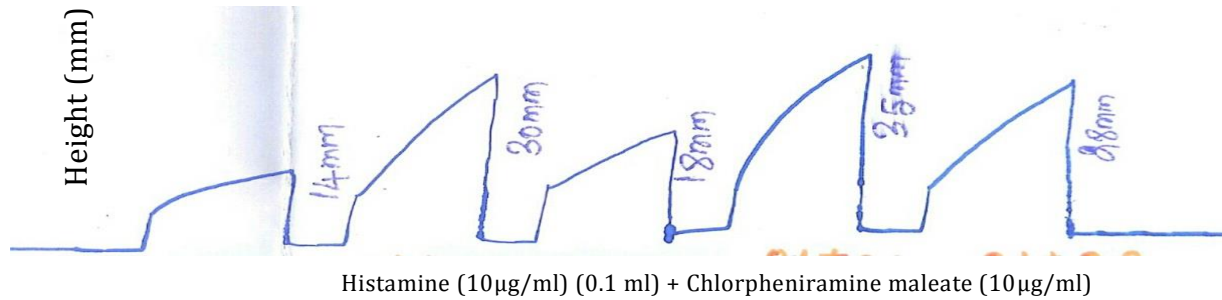


Figure: 2 Effect of the chlorpheniramine maleate against histamine on guinea pig ileum. (HAESA)

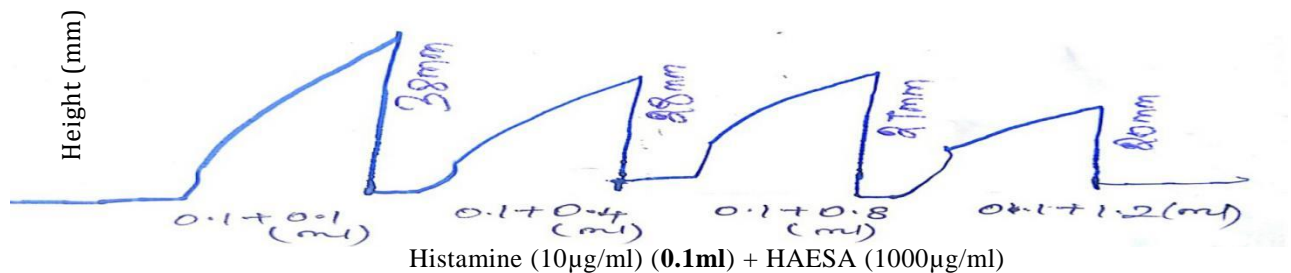


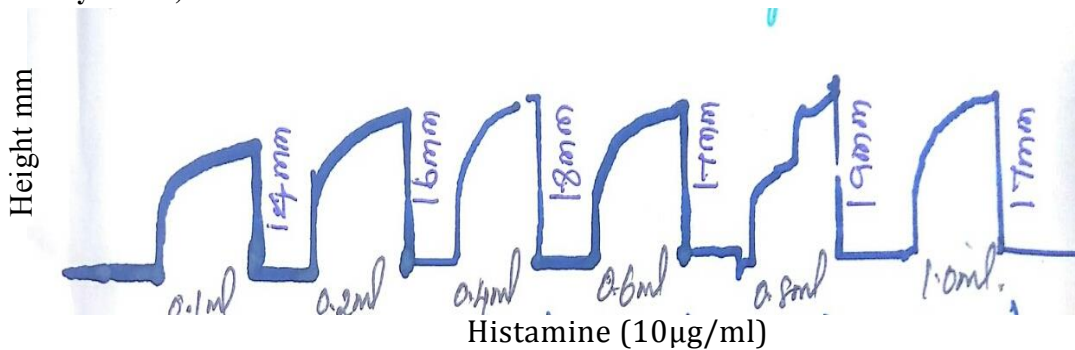
Figure: 3 Effect of the hydro alcoholic extract of *Sida acuta* against Histamine on guinea pig ileum. (HAESA)

**Table: 1 Effect of the hydro alcoholic extract of *Sida acuta* against Histamine on guinea pig ileum. (HAESA)**

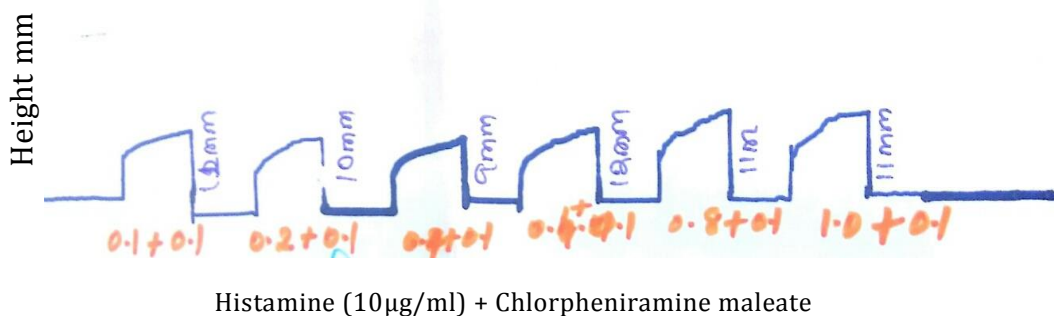
S.no	Treatment	Dose(10µg/ml)	Height response (h)(mm)	Control height (H) (mm)	Percentage Inhibition of response due to test drug. (H-h/H×100)	
1	Histamine	0.1 ml	33mm	33mm	-----	
		0.4 ml	42mm			
		0.6 ml	49mm			
		0.8 ml	50mm			
		1.0 ml	48mm			
		1.2 ml	48mm			
2	HAESA (1000µg/ml) +Histamine	0.1ml+0.1ml	38mm	-----	-0.15%	
		0.4ml+0.1ml	28mm		15.15%	
		0.8ml+0.1ml	27mm		18.18%	
		1.2ml+0.1ml	20mm		39.39%	
		0.1ml+0.1ml	14mm			
	Chlorpheniramine mealeate (10µg/ml) +Histamine			30mm		57.57%
		0.2ml+0.1ml				19.0%
		0.4ml+.1ml	18mm		45.45%	
		0.6ml+1ml	35mm		-6.06%	
		0.8 ml+0.1ml	28mm		15.15%	

**DETERMINATION OF ANTIHISTAMINIC ACTIVITY OF HYDRO ALCOHOLIC EXTRACT OF SIDA ACUTA BURM (LEAVES) (HAESA) BY USING GUINEA PIG TRACHEA**

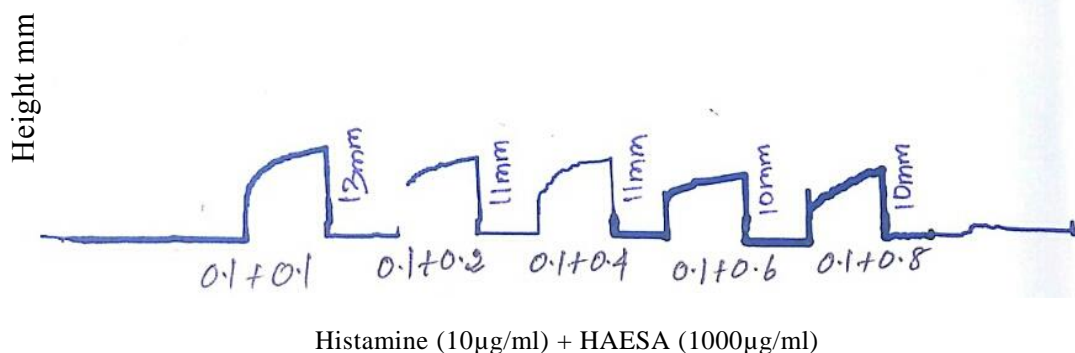
The antihistaminic effect determined for the hydro-alcoholic extract of *Sida acuta* Burm as per (Kulkarni 2003 and Goyal 2007)



**Figure: 4 DRC of histamine in guinea pig trachea**



**Figure: 5 Effect of the Chlorpheniramine maleate against Histamine on guinea pig trachea. (HAESA)**



**Figure: 6 Effect of the Hydro alcoholic extract of *Sida acuta* against Histamine on guinea pig trachea. (HAESA)**

**Table: 2 Effect of the Hydro alcoholic extract of *Sida acuta* against Histamine on guinea pig ileum. (HAESA)**

S.no	Treatment	Dose(10µg/ml)	Height response (h)(mm)	Control height (H) (mm)	Percentage Inhibition of response due to test drug. (H-h/H×100)
1	Histamine	0.1ml	33mm	33mm	-----
		0.4 ml	42mm		
		0.6 ml	49mm		
		0.8 ml	50mm		
		1.0 ml	48mm		
		1.2 ml	48mm		
2	HAESA (1000µg/ml) +Histamine	0.1ml+0.1ml	13mm	-----	60.6%
		0.2ml+0.1ml	11mm		66.67%
		0.4ml+0.1ml	11mm		66.67%
		1.6ml+0.1ml	10mm		69.69%
		0.1ml+0.1ml	11mm		66.67%
	Chlorpheniramine mealeate (10µg/ml) +Histamine	0.2+0.1ml	10mm		69.69%
		0.4+0.1ml	9mm		72.72%
		0.6+0.1ml	12mm		63.63%
		0.8+0.1ml	11mm		66.67

The percentage inhibition of Hydro-alcoholic extract of *Sida acuta* (100µg/ml) on histamine induced contraction showed was found to be 60.6% in comparison with chlorpheniramine (1µg/ml) 69.69%. Therefore the hydro alcoholic extract showed comparable anti histaminic effect with that of chlorpheniramine maleate.

## CONCLUSION

The present research draws the conclusion that hydro-alcoholic extract of *Sida acuta* plant showed

moderate antihistaminic effect, which may be due to the combined nature phytoconstituents.

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