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Invitro alpha amylase effect of *Sida acuta* Burm

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ABSTRACT

Introduction

Sida acuta is 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 gonorrheae.

Methods

Preparation of hydroalcoholic extract of *Sida acuta* and Hydro-alcoholic extract of *Sida acuta* was evaluated for its antidiabetic studies by alpha amylase method.

Results

The inhibitory concentration (IC_{50}) of Hydro-alcoholic extract of *Sida acuta* against alpha amylase inhibitory effect was found to be 17.10µg/ml in comparison with acarbose 9.27µg/ml. Hydro-alcoholic extract of *Sida acuta* showed significant alpha amylase inhibitory effect when compared with acarbose. Hence preparation may be formulated with hydro-alcohol and aqueous extract.

Conclusion

The present research draws the conclusion that *Sida acuta* plant showed mild antidiabetic effect, which may be due to the phytoconstituents.

Keywords: Alpha amylase, *Sida acuta*, Malvaceae

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, gonorrheae [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-ketopinoresinol, polyphenol, sesquiterpene[7], 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], hepataprotective [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], cytototoxicity [33], cardiovascular [34], antifungal[35], anticancer [36].

The modern medicine causes abdominal pain, nausea, bloating, mild diarrhea, rashes and tiredness so this study was undertaken to investigate invitro alpha amylase 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 ALPHA AMYLASE INHIBITORY ACTIVITY OF *Sida acuta* Burm

The alpha amylase inhibitory effect was determined for the hydro-alcoholic extract of *Sida acuta* Burm as per **(Ali, H et al 2006)**

PROCEDURE

A starch solution (1%w/v) was prepared by stirring 1g starch in 100 ml of 20Mm of phosphate buffer (Ph 6.9) containing 6.7mM sodium chloride. The enzyme solution was prepared by mixing 27.5mg of porcine pancreatic α-amylase (PPA) in 100 ml of 20mM of phosphate buffer (PBS,PH 6.9) containing 6.7mM of sodium chloride. To 100µl of (10, 15 µg/ml) plant extract.200 µl (1%) starch solution was added and the mixture was incubated at 37^0c for 20 min. To the reaction mixture 100µl (1% starch solution was added and incubated at 37^0c for 10 min. The reaction was stopped by adding 200µl DNSA and kept it in a boiling water bath for 5 minutes. The reaction mixture diluted with 2.2 ml of water and absorbance was read at 540nm. For each concentration, blank tubes were prepared by replacing the enzyme solution with 200µl in distilled water. Control representing 100% enzyme activity was prepared in a similar manner, without extract. The experiments were repeated thrice using the same protocol. The results are depicted in **Table: 1** and displayed in **Fig: 1**

RESULTS AND DISCUSSION

Hydro-alcoholic extract of *Sida acuta* was subjected to alpha amylase inhibition by (Ali H., 2006)

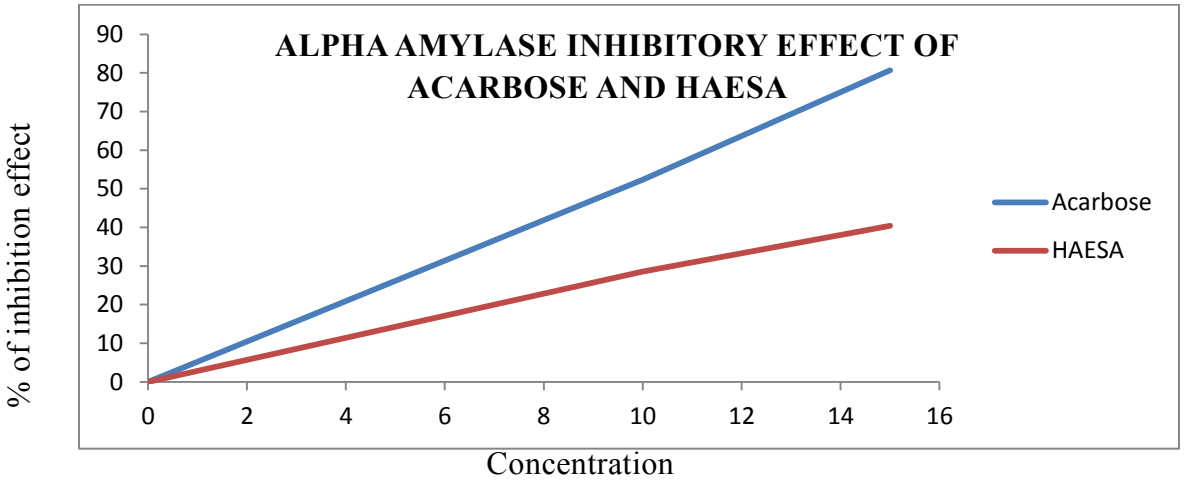

Figure: 1 Determination of Alpha amylase inhibitory effect of Acarbose and HAESA

Table: 1 Determination of Alpha amylase inhibitory effect of *Sida acuta* Burm(leaf) (HAESA)

S. No.	Concentration of acarbose/ HAESA (µg/ml)	Percentage inhibition of acarbose	Percentage inhibition of HAESA
1	10	52.33 ± 0.002	28.6 ± 0.02
2	15	80.66. ± 0.003	40.43 ± 0.04
		IC_{50}-9.27(µg/ml)	IC-$_{50}$-17.10(µg/ml)

*mean ± SEM

The inhibitory concentration (IC_{50}) of hydro alcoholic extract of *Sida acuta* (leaf) against alpha amylase activity was found to be 17.10µg/ml in comparison with acarbose (9.27µg/ml).

CONCLUSION

Hydro-alcoholic extract of *Sida acuta* burm showed significant alpha amylase inhibitory effect when compared with acarbose therefore preparations may be formulated with hydro-alcohol and aqueous extract. These plant preparations may be used as adjuvant therapy which may be helpful in the management of diabetes.

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