

# To Evaluate the Inhibition of Alpha Amylase and Alpha Glucosidase of Asparagus Recemosus. Willd

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## ABSTRACT

Our Siddha system of medicine is the most safest and effective system. Asparagus racemosus. Willd is a species of Asparagus common throughout the India and Himalayas. The parts used are leaf and root. The Pharmacological activity of this plant is nutritive, demulcent, galactagogue, aphrodisiac, antispasmodic, antioxidant. This plant also has Phytochemical constituents such as total flavonoids, tanins, triterpenoids, phenolic, saponins, amino acids and protein. This Paper is discuss about 'Anti Diabetic' activity. The aim of this research paper is to evaluate the inhibitory activity of alpha amylase and alpha glycosidase at varying concentrations on diabetes mellitus type 2. This research is done in the aqueous plant extract of Asparagus racemosus. Willd formulation of alpha amylase inhibit on assay and alpha glucosidase inhibition assay on Diabetes Mellitus type 2.

**KEYWORDS:** *Asparagus racemosus. Willd, Diabetes Mellitus, Anti Diabetic, Alpha amylase, Alpha Glucosidase*

## INTRODUCTION

Diabetes mellitus is a chronic disease caused by inherited or acquired deficiency in insulin secretion and by decreased responsiveness of the organ to the secreted insulin. Such a deficiency result in increased blood glucose level, which inturn can damage many of the blood system including blood vessels and nerves [1]. Diabetes Mellitus is a clinical condition characterized by hyperglycemia in which an elevated amount of glucose circulates in the blood in Diabetes mellitus type 2. This Research Paper is discuss about 'Anti Diabetic' activity. It is called as 'Madhumegam'. Our Siddha system of medicine Madhumegam classifies into 20 types based on Vatham, Pitham and Kapham. In this Vatham 6 types, Pitham 4 types and Kapham 10 types [2,3]. But in modern aspect it is classified into two types as DM type 1 and DM type 2 based on the requirement of insulin and etiology [4].

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In modern medicine, drug therapy does not plays a sufficient role in Diabetes Mellitus. So the people used to go for natural, safe and herbal remedies like Siddha. Though Diabetes Mellitus is considered as incurable disease it can be treated, reduced and controlled by Siddha system of medicine. People all over the world are in search of harmless and safe remedies to chronic diseases. As India is the captial of Diabetes Mellitus. Our Siddha medicine of system plays a very important role in controlling Diabetes Mellitus. In India Diabetes Mellitus can be treated by herbal with actions of Antidiabetic and Anti Hypoglycemic activity. This paper says about the management of Diabetes Mellitus type 2 using natural herbals. In this, the most important herb is Asparagus racemosus. Willd it contain a Anti Diabetic activity [5].The aqueous extract of this plant was assayed for biopharmaceutical potential against type 2 diabetes mellitus by alpha amylase and alpha glycosidase.

**TAXONOMY OF ASPARAGUS RACEMOSUS. WILLD****KINGDOM:** Plantae**DIVISION:** Magnoliophyta**CLASS:** Liliopsida**ORDER:** Asparagales**FAMILY:** Liliaceae**SUBFAMILY:** Asparagoideae**GENUS:** Asparagus**SPECIES:** Racemosus**BINOMIAL NAME:** Asparagus racemosus. Willd [6,7].**Fig. 1 Asparagus racemosus. Willd****MATERIALS AND METHODS****COLLECTION OF RAW DRUGS**

The Plant of *Asparagus racemosus*. Willd are collected from Tenkasi District of TamilNadu during the month of Aug 2020 the plant was identified as *Asparagus racemosus* in Botany department of Maria Siddha Medical College and Hospital. The leaves and roots were washed under running tap water, air dried, and homogenized to powder form and stored in the airtight glass bottle.

**ANTI-DIABETIC ASSAY** **$\alpha$ - AMYLASE INHIBITION ASSAY**

A total of 500  $\mu$ l of reaction mixture contains test sample (1mg/ml) and standard drug (100-1000 $\mu$ g/ml) were added to 500  $\mu$ l of 0.20 mM phosphate buffer (pH 6.9) containing  $\alpha$ -amylase (0.5mg/ml) solution and were incubated at 25°C for 10 min. After these, 500  $\mu$ l of a 1% starch solution in 0.02 M sodium phosphate buffer (pH 6.9) was added to each tube. The reaction mixtures were then incubated at 25°C for 10 min. The reaction was stopped with 1.0 ml of 3, 5 dinitrosalicylic acid color reagent. The test tubes were then incubated in a boiling water bath for 5 min, cooled to room temperature. The reaction mixture was then diluted after adding 10 ml distilled water and absorbance was measured at 540 nm against

positive control (Acarbose). The IC<sub>50</sub> value was calculated and plotted using linear regression graph [8,9].

 **$\alpha$ - GLUCOSIDASE INHIBITION ASSAY**

The inhibition of  $\alpha$ -glucosidase activity of test sample was determined using the modified method. 1 mg of  $\alpha$ -glucosidase was dissolved in 100 mL of phosphate buffer (pH 6.8) containing 200 mg of bovine serum albumin. The reaction mixture of 10  $\mu$ L of test sample was premixed with 490  $\mu$ L phosphate buffer pH 6.8 and 250  $\mu$ L of 5 mM *p*-nitrophenyl  $\alpha$ -D-glucopyranoside was added to the mixture. Followed by preincubating at 37°C for 5 min, add 250  $\mu$ L  $\alpha$ -glucosidase (0.15 unit/mL) and incubated at 37°C for 15 min. The reaction was terminated by adding 2 mL 200 mM Na<sub>2</sub>CO<sub>3</sub>.  $\alpha$ -glucosidase activity was determined spectrophotometrically at 400 nm by measuring the quantity of *p*-nitrophenol released from *p*-NPG. Acarbose was used as positive control of  $\alpha$ -glucosidase inhibitor. The concentration of the test sample required to inhibiting the 50% of  $\alpha$ -glucosidase activity under the assay conditions was defined as the IC<sub>50</sub> value [10, 11].

The inhibitory percentage are calculated by the following equation [12].

% of inhibition =  $(OD \text{ of control} - OD \text{ of sample}) / OD \text{ of control} \times 100$  Whereas,

OD control = Absorbance of control reaction,

OD of sample = Absorbance in the presence of the samples of extracts.

**CALCULATION OF IC<sub>50</sub> VALUE FOR TEST SAMPLE**

To calculate the IC<sub>50</sub> value: The inhibitor concentration against the percent activity is plotted ([I]-Activity % graph). Using the linear ( $y=mx+n$ ) or parabolic ( $y=ax^2+bx+c$ ) equation on this graph for  $y=50$  value  $x$  point becomes IC<sub>50</sub> value.

**RESULT AND DISCUSSION****IC<sub>50</sub> VALUE OF TEST SAMPLE FOR THE INHIBITION OF  $\alpha$  - AMYLASE**

The calculated IC<sub>50</sub> value of test sample is 3.990mg/ml to inhibit 50% of  $\alpha$  - amylase activity. The IC<sub>50</sub> value of positive control (Acarbose) is 4.537 mg/ml. The inhibition percentage of  $\alpha$  - amylase was tabulated in table: 1.

**IC<sub>50</sub> VALUE OF TEST SAMPLE FOR THE INHIBITION OF  $\alpha$  - GLUCOSIDASE**

The calculated IC<sub>50</sub> value of test sample is 3.615mg/ml to inhibit 50% of  $\alpha$  - amylase activity. The IC<sub>50</sub> value of positive control (Acarbose) is 3.657 mg/ml. The inhibition percentage of  $\alpha$  - amylase was tabulated in table: 1.

**Table:1. INHIBITION PERCENTAGE OF  $\alpha$  – AMYLASE AND  $\alpha$  – GLUCOSIDASAE**

S. No	SAMPLE	% OF INHIBITION OF $\alpha$ AMYLASE (1mg/ml)	% OF INHIBITION OF $\alpha$ GLUCOSIDASE (1mg/ml)
1.	Ar (aq)	12.53 $\pm$ 0.09	13.83 $\pm$ 0.06
2.	Acarbose (PC)	11.02 $\pm$ 0.19	13.67 $\pm$ 0.16

**INTERPRETATION**

The aqueous plant extract of *Asparagus racemosus*. Willd was assayed for the biopharmaceutical potential against Type II Diabetic Mellitus by evaluate the inhibitory effects on Alpha-amylase and Alpha-glucosidase hence both the enzymes influence in hyperglycemia in type II diabetic mellitus by hydrolyses the excessive carbohydrates into simplest glucose monomers and facilitates the adsorption of glucose in small intestine and consequently causes hyperglycemia. Outcome of the assays showed that the plant has a possible source against type II diabetic mellitus and exhibiting foremost inhibiting effects compared with acarbose (positive control) on above mentioned enzymes.

**CONCLUSION**

Though our siddha system of medicine has most other precious herbs for the management of Diabetes Mellitus, *Asparagus racemosus*. Willd is also one of the most effective for DM type 2. Many other research should be done on other herbs also to gain our knowledge and also to improve our Siddha system of medicine.

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