

# ALPHA AMYLASE INHIBITORY ASSAY OF ACACIA CATECHU LEAF EXTRACT-AN INVITRO STUDY

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**ABSTRACT:** The aim of this study is to assess the Alpha amylase inhibitory assay of *Acacia catechu* leaf extract. Diabetes is defined as the group of metabolic diseases in which the person has high blood glucose, either because of insulin production is inadequate, or because the body's cells do not respond properly to insulin, or both. Patients with high blood sugar will typically experience polyuria(frequent urination),they will become increasingly thirsty (polydipsia) and hungry ( polyphagia).The *Acacia catechu* is known as cutch tree, Terra japonica as well as black catechu. It contains tannins and flavonoids majorly. The leaf extract are used as ananodyne, bactericide, refrigerant, detergent, astringent, styptic, masticatory, expectorant, stimulant, antiphlogistic and as an anti-inflammatory agent.  $\alpha$ -Amylase is a protein that hydrolyses alpha bonds of large, alpha-linked polysaccharides, such as starch and glycogen, yielding glucose and maltose. It is the major form of amylase found in humans and other mammals. It is also present in seeds containing starch as a food reserve, and is secreted by many fungi. Alpha amylase inhibitory assay is used to demonstrate its antidiabetic activity. The present study targets the potential use of *Acacia catechu* which could be an alternate approach for many diseases such as diabetes.

**Keywords:** *Acacia catechu*, alpha amylase, Diabetes, leaf extract.

## INTRODUCTION:

Diabetes is a group metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of differentorgans, especially the eyes, kidneys, nerves, heart, and blood vessels. [1].Several pathogenic processes are involved in the development of diabetes. These range from autoimmune destruction of the cells of the pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action. [2].The basis of the abnormalities in carbohydrate, fat, and protein metabolism in diabetes is deficient action of insulin on target tissues. [3].Unlike modern Allopathic drugs,herbal remedies work in a way that depends on orchestral approach. Medicinal herbs have been source of wide range of biologically active compounds for many centuries and they have been used extensively as crude drugs or as pure components for treating varieties of disease conditions[4].*Acacia catechu* Willd. belongs to the family *Fabaceae* and subfamily *mimosoideae*. It is widely used in Ayurveda for many diseases and mainly skin diseases. People in Kerala use boiled khadira water (karungali water) for drinking purpose. Many Ayurvedic oil preparation use khadira as one of its active ingredient [5-7]. *Acacia catechu* has strong astringent and anti diabetictivity. It is most commonly known as katha which is an ingredient of Pan, a beetle leaf preparation chewed in India. It is used to reduce the oozing from chronic ulcers and as an astringent In throat, dental and oral infections. [8-10].

## Materials and Methods:

### Plant material:

*Acacia catechu* leaf extract was obtained fromGreen Chem Herbal Extracts & Formulations, Bangalore.

### In vitro alpha amylase method:

100  $\mu$ l, of the bark extract was allowed to react with 200  $\mu$ l of  $\alpha$  amylase enzyme and 100  $\mu$ l of 2mM of Phosphate buffer (pH 6-9). After 20 minute incubation, 100  $\mu$ l of 1% starch solution was added. The same was performed for the controls where 200  $\mu$ l of enzyme was replaced by buffer, after incubation for 5 minutes, 500  $\mu$ l of dinitro salicylic acid reagent was added to both control and test. They were kept in boiling water bath for 5 minutes. The absorbance was recorded at 540 nm using spectrophotometer and the percentage inhibition of  $\alpha$  amylase was calculated using the formula: (11)

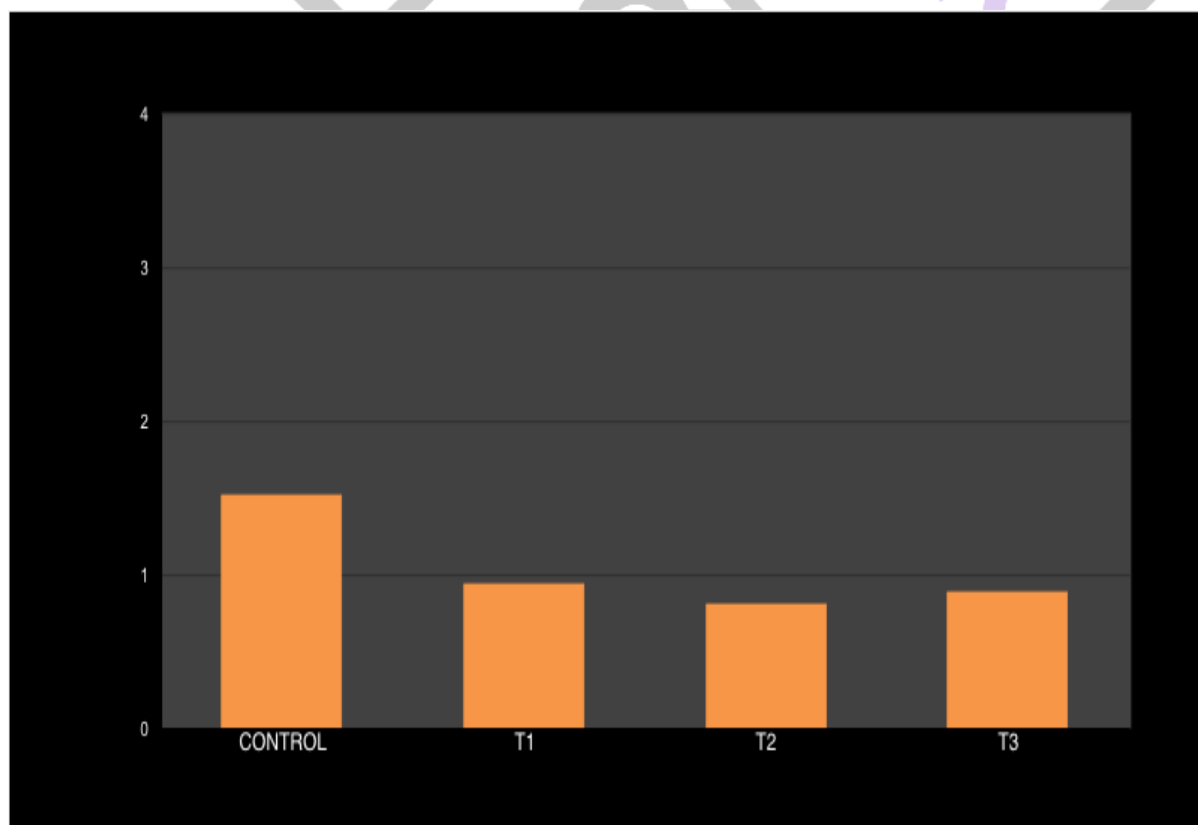
$$\% \text{ inhibition} = 100 \times \frac{\text{Control} - \text{test}}{\text{Control}}$$

**Result and Discussion:**

Amylase inhibitors are of microbial origin. these drugs help in maintaining constant level of glucose in blood by delaying the breakdown of starches. Enzyme inhibitors can be a potential target in many areas of disease control and treatment, as enzymes catalyze the most important biochemical pathways. Diabetes mellitus is one of the most common endocrine diseases characterized by hyperglycemia due to absolute or relative deficiency of insulin. One anti diabetic therapeutic approach is to reduce gastrointestinal glucose production and absorption through the inhibition of alpha amylase enzyme plays a major role in preventing rise in postprandial glucose level in diabetics.

In the present study conducted, it was observed that there is a dose dependent increase in inhibition of alpha amylase enzyme with increase in the concentration comparatively with the standard. Three different concentrations viz., 0.96, 0.88, 0.89 and control of 1.47 were separately tested for alpha amylase activity. Amongst the different concentrations, Control (acarbose) has the highest inhibition of 85.21%.

Control acarbose	1.4720
T1	0.9613
T2	0.8836
T3	0.8923
% inhibition	85.21%



**Conclusion:**

*Acacia catechu* leaf is proved to be an promising candidate for the management of type-2 diabetes mellitus. Since, it has a great potential in medicinal field it can be used as an alternative medicine in our future prospect of life.

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