



ORIGINAL RESEARCH PAPER

Medicinal Plants

IN VIRO ANTIDIABETIC ACTIVITY OF YUCCA FILAMENTOSA FLOWER EXTRACT

KEY WORDS:

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INTRODUCTION

Yucca is a perennial plant native to hot and dry regions of the Americas and the Caribbean with more than 40 known species. It is known for its sword-like leaves and whitish clusters of blossoms.

Yucca is used in gardens for ornamental purposes, but there are parts of the plant that are edible and are said to have medicinal properties. Depending on the species, these may include the root, seeds, blossoms, flowering stems, and the purplish yucca fruit

Yucca filamentosa is commonly known as Adam's Needle It is a 6 ft. flowering stalk with high clumps of erect, dagger-like, blue-green leaves

OBJECTIVES

This study was conducted to investigate the potential use of Flower extracts of yucca filamentosa as α -amylase and α -glucosidase inhibitors.

MATERIALS AND METHODS:

Plant Collection & Identification:

Fresh flowers were collected and the flowers and plants were authenticated by Prof. Dr. Jayaraman. Director, Plant Anatomy Research Institute, Tambaram, Chennai.

Preparation of Flower Extract:

The plant materials were air-dried at room temperature (26°C) for two weeks, after which it was ground to a uniform powder. The powdered (100gm) was extracted three times by cold percolation method with 300 ml of acetone and hydro ethanol at room temperature for 72 hrs the filtrates were concentrated under reduced pressure at 40°C and stored in refrigerator at 2-8°C for use in subsequent experiments.

Invitro Antidiabetic Effect:

Alpha- Amylase Inhibition Assay Procedure:

Alpha-amylase activity can be measured in-vitro by hydrolysis of starch in presence of α -amylase enzyme. This process was quantified by using iodine, which gives blue colour with starch. The reduced intensity of blue colour indicates the enzyme-induced hydrolysis of starch into monosaccharides α -Amylase was premixed with the yucca filamentosa flower extracts at various concentrations (20-100 μ g/ml) and 0.5% starch solution was added at 37°C for 5 min to start the reaction and terminated by addition of 2 ml of 3,5-dinitrosalicylic acid (Holecheck et al. 1982). The reaction mixture was heated for 15 min at 100°C and diluted with 10 ml of distilled water in an ice bath α -Amylase activity was determined by measuring spectrum at 540 nm and IC50 value was measured.

RESULTS AND DISCUSSION

There was a dosage-dependent increase in percentage inhibitory activity against alpha amylase enzyme. It showed

50% inhibition at a concentration of HEEYF-54 μ g/ml, AEYF-78 μ g/ ml. The order of α -glucosidase inhibitory activity was Acarbose> HEEYF> AEYF.

Alpha-amylase catalyses the hydrolysis of alpha-1, 4-glycosidic linkages of starch, glycogen and various oligosaccharides. Alpha-glucosidase is a glucosidase located in the brush border of the small intestine that acts upon 1, 4-alpha bonds. This is in contrast to beta-glucosidase. Alpha-glucosidase breaks down starch and disaccharides to glucose. Alpha-glucosidase inhibitors are work by preventing the digestion of carbohydrates (such as starch and table sugar) by inhibition of enzyme alpha glucosidase.

Carbohydrates are normally converted into simple sugars (monosaccharides), which can be absorbed through the intestine. Hence, alpha-glucosidase inhibitors reduce the impact of carbohydrates on blood sugar Alpha-glucosidase further breaks down the disaccharides to simple sugars, readily available for intestinal absorption.

The inhibition of their activity in the digestive tract of humans is considered to be effective tool to control diabetes. The Hydroethanol extracts of Yucca filamentosa flower have exhibited potent inhibition of alpha-amylase and alpha-glucosidase enzyme activity. In addition, HEEYF was able to inhibit both the enzymes at lower concentration. glucosidase inhibitory activity. Further studies are required to elucidate whether Yucca filamentosa have antidiabetic potential by in vivo for validating the traditional claim of the plant

CONCLUSION:

In this present study we evaluated in vitro alpha amylase and alpha glucosidase activity of crude hydroethanol and acetone extract of Y. filamentosa flowers.

The plant showed significant inhibition activity, so further the compound isolation, purification and characterization which is responsible for inhibiting activity, has to be done for the usage of antidiabetic agent.

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