Original Research Article

Invitro antidiabetic activity of sprouts of Borassus flabellifer linn

S Thamizharasan[1*], C S Brethis[2], A Sumitha[3], Ankitabist[4], K Kiruthikashree[5]

[1,2]Associate Professor, [3, 4] Assistant, [5]Tutor, Professor Department of Pharmacology, ACSMCH, Dr. MGR Educational And Research Institute, Chennai
Email: thamizhpharma@gmail.com

Abstract

Background: Diabetes mellitus is a metabolic disorder characterized by a loss of glucose homeostasis with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both. **Method:** Glycosylated hemoglobin is measured primarily to identify the average plasma glucose concentration over prolonged periods of time. In diabetes mellitus higher amounts of glycated hemoglobin indicates poor control of blood glucose levels. **Objectives:** The main objective of this work is to evaluate the in vitro anti diabetic activity of sprouts of Borassus flabellifer linn, palmyra palm. **Results:** The methanolic extracts of the sprouts also showed a considerable inhibition of the haemoglobin glycosylation as compared to standard gallic acid. The results of the work indicate that the selected plants possessed considerable invitro anti diabetic activity.
Key Words: Borassus flabellifier, antidiabetic activity, alpha glucosidase, palmyra palm

[*]**Address for Correspondence:**
Dr S.Thamizharasan, Associate Professor, Department of Pharmacology, ACS Medical College and Hospital, Dr.MGR Educational and Research Institute, Chennai, India.
Email: thamizhpharma@gmail.com
Received Date: 09/12/2019 Revised Date: 11/01/2020 Accepted Date: 04/02/2020
DOI: https://doi.org/10.26611/10101332

Access this article online	
Quick Response Code:	Website: www.medpulse.in
	Accessed Date: 01 March 2020

INTRODUCTION

Plants have served mankind since ages as they are reservoirs of important medicinal components and help to alleviate chronic diseases. Medicinal plants play an appreciable role in the development of modern herbal medicines as many diseases like cancer, liver diseases and arthritis find no complete cure in allopathy. The bioactive compounds of medicinal plants are used as anti diabetic, chemotherapeutic, anti inflammatory, anti arthritic agents where no satisfactory cure is present in modern medicines. Many plants have shown their immense potential to fight against dreadful diseases including cancer. Diabetes mellitus is a chronic endocrine disorder that affects the metabolism of carbohydrates, proteins, fat, electrolytes and water and includes a group of metabolic diseases characterized by hyperglycemia. Currently, there is growing interest in herbal remedies due to the side effects associated with the oral hypoglycemic agents for the treatment of diabetes mellitus. Hence the traditional herbal medicines are mainly obtained from plants are used in the management of diabetes mellitus. Biological actions of the plant products used as alternative medicines to treat diabetes are in relevance to their chemical composition. Herbal products or plant products are rich in flavonoids, phenolic compounds, coumarins, terpenoids and other constituents which help to reduce blood glucose levels. Several species of herbal drugs with potential antidiabetic activity have been described in the scientific literature. Herbal drugs are prescribed due to their good effectiveness, fewer side effects in clinical experience and relatively low costs. Medicinal and natural herbal plant products are traditionally used from long time in many countries for the treatment of diabetes mellitus. One such plant, Borassus flabellifer L, belongs to family Arecaceae, commonly known as Palmyra palm is a native of tropical Africa but cultivated throughout India. Traditionally the different parts of the plant such as root, leaves, fruit, and seeds are used for various human disorders. Leaves are

How to cite this article: S Thamizharasan, C S Brethis, A Sumitha, Ankitabist, K Kiruthikashree. Invitro antidiabetic activity of sprouts of Borassus flabellifer linn. *MedPulse International Journal of Pharmacology.* March 2020; 13(3): 28-30.
https://www.medpulse.in/Pharmacology/

used for thatching, mats, baskets, fans. Flowers of B. flabellifer were investigated for analgesic and antipyretic effects, anti-inflammatory activity, haematological, biochemical parameters, and immunosuppressant property. The different parts of the plant are being used for medicinal properties like antihelminthic and diuretic. The fruit pulp of B. flabellifer has been used in traditional dishes and the sap, has been used as a sweetener for diabetic patients. Phytochemical studies of the plant revealed the presence of spirostane-type steroid saponins; steroidal glycoside also contains a bitter compound called flabelliferrins. The present work was to evaluate the in vitro anti diabetic activity of methanolic extracts of sprouts of Borassus flabellifer linn by studying their effects on inhibition of glycosylation of haemoglobin and glucose transport across yeast cells.

MATERIALS AND METHOD

a. Plant material: A natural food coloring substance can be extracted from the husk or mesocarp. The seeds are sown on top of mounds and watered regularly within 45-60 days before germinating. The embryonic axis grows downward within a long apical tube into the soil and strikes roots. Growing upward from the roots is a bladeless first leaf within which accumulated food material translocate from the endosperm, thereby forming the starchy tuber. The fresh sprouts of Borassus flabellifer linn were collected from vellore and authenticated by Dr.P.Jayaraman, Director, Plant Anatomy Research Centre, Medicinal Plants Research Unit, Tambaram, Chennai. A portion of the sample was kept in the department museum for further reference.

b. Preparation of extracts: The shade dried powdered form of sprouts of Borassus flabellifer linn was taken and subjected to successive extraction using Ethanol, and methanol by continuous percolation process in soxhlet apparatus. The aqueous extract was prepared by the maceration with double distilled water. Each extract was concentrated by distilling off the solvent and evaporated to dryness. The extracts were dissolved in 1% carboxy methyl cellulose (CMC) and used for the present study.

c. Effects of Various Extracts on In vitro Inhibitory Glucose Diffusion: A simple model system was used to evaluate the effects of Borassus flabellifer linn extracts on glucose movement in vitro. The model was adapted from a method described by Edwards *et al.* which involved the use of a sealed dialysis tube into which 15ml of a solution of glucose and sodium chloride (0.15M) was introduced and the appearance of glucose in the external solution was measured. The model used in the present experiment consisted of a dialysis tube (6cmX15mm) into which 1ml of 50g/litre plant extract in 1% CMC and 1ml of 0.15M sodium chloride containing 0.22M D-glucose was added. The dialysis tube was sealed at each end placed in a 50ml centrifuge tube containing 45ml of 0.15M sodium chloride. The tubes were placed on an orbital shaker and kept at room temperature. The movement of glucose into the external solution was monitored at set time intervals.

d. Statistical Analysis Data are expressed as mean ± S.E.M. Statistical comparisons between groups were done by one way analysis of variance (ANOVA) followed by Tukey Kramer multiple comparison tests to analyze the differences.

RESULTS

The effect of Borassus flabellifer linn sprout extract as anti-diabetic agents has been studied. All extracts showed varying effect on glucose utilization. These extracts caused a significant decrease in glucose concentration during the experiment. The effects of Borassus flabellifer linn extracts on glucose diffusion inhibition were summarized in Table.1. At the end of 24 hrs, glucose movement of control (without plant extract) in the external solution had reached a plateau with a mean glucose concentration above 280mg/dl (280.13±1.54). It was evident from the table that the methanol and aqueous extracts were found to be potent inhibitors of glucose diffusion($p<0.001$) compared to control. The methanol extract was found to be more potent than other extracts showing the lowest mean glucose concentration of 210.45±1.43 mg/dl at the end of 24 hr(Table 1).

Table 1: Effects of Borassus flabellifer linn extracts on glucose movement in vitro method

Extract 50g/litre	1hr	3hr	5 hr	24hr
Control	112.34	198.21	214.43	280.13
Ethanol extract	92.13	148.47	186.21	240.11
Methanol extract	78.65	122.74	145.55	210.45
Aqueous extract	87.22	132.92	150.12	223.76

DISCUSSION AND CONCLUSION

There are innumerable medicinal uses for all parts of the Palmyra palm. Briefly, the young plant is said to relieve biliousness, dysentery, and gonorrhea. Young roots are diuretic and anthelmintic, and a decoction is given in certain respiratory diseases. The Borassus flabellifer linn extract and the isolated compounds, tyrosol and glucosyl-(6-1)-glycerol exhibited good anti diabetic activity. Palm fruits has anti-inflammatory and antioxidant properties. The antioxidant activity could be attributed due to the presence of high content of crude flavonoids, saponins and phenolic compounds. Leaves shows antioxidant, antibacterial activities. The spadix of the Borassus

flabellifer is used to relieve heartburn and enlarged spleen and liver. In this paper, detailed study on anti diabetic property of the plant Borassus flabellifer has been discussed. The results of the work indicate that the Borassus flabellifer linn possessed considerable invitro anti diabetic activity and further these effects need to be confirmed using in vivo models for its effective utilization as therapeutic agents.

REFERENCES

1. Stalin.C , Vivekanandan.K and Bhavya.E , In Vitro Antidiabetic Activity of Cardiospermum Halicacabum leaves Extracts: Global Journal of Medical research Pharma, Drug Discovery, Toxicology and Medicine Volume 13 Issue 7 , Year 2013.
2. Sindhu.S.Nair , Vaibhavi Kavrekar , Anshu Mishra, Evaluation of In Vitro Anti diabetic Activity of Selected Plant Extracts, International Journal of Pharmaceutical Science Invention, www.ijpsi.org Volume 2 Issue 4 ,April 2013 , PP.12-19
3. Syamsudin. Standardization of extract of Leucaenaleucocephala (lmk) De Wit seeds by αglucosidase inhibitor. International Journal of Phytomedicine 2010; 2: 430-435.
4. Annamalai A, Ponmari1 G, Sathishkumar R, Lakshmi P.T.V. Effect Of Drying Treatment On The Contents Of Antioxidants In Cardiospermum Halicacabum Linn. International Journal of Pharma and Bio Sciences (2011);2(1):304-313.
5. Sukanya Dej adisai, Thanet Pitakbut and Chatchai Wattanapiromsakul. (2017); Alpha-glucosidase inhibitory activity and phytochemical investigation of Borassus flabellifer Linn; Afr.J. Pharm.Pharmacol; 11(3);45-52.

Source of Support: None Declared
Conflict of Interest: None Declared