

PHYTOCHEMICAL AND ANTI DIABETIC ACTIVITY OF AQUEOUS EXTRACT OF *MORINDA CITRIFOLIA* FRUIT IN ALLOXON INDUCED DIABETIC RATS

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ABSTRACT

The anti diabetic potential, effects of aqueous extract of *Morinda citrifolia* (Rubiaceae) fruit in alloxan-induced diabetic rats was investigated. Aqueous extract of *Morinda citrifolia* fruit produced a significant anti diabetic activity at tested dose levels. Phytochemical Screening of extract and powder of *Morinda citrifolia* was tested for the presence of chemical constituents.

Keywords: *Morinda citrifolia* fruit pylorus ligation, anti diabetic activity, Phyto chemicals.

INTRODUCTION

Diabetes mellitus, often referred to simply as diabetes, is a syndrome of discovered as abnormal fuel metabolism, usually due to a combination of hereditary and environment causes, resulting in abnormally high blood sugar levels (hyperglycemia). Blood glucose levels are controlled by a complex interaction of multiple chemicals and hormones in the body, including the hormone insulin made in the beta cells of the pancreas. Diabetes develops due to a diminished production of insulin (in *type 1*) or resistance to its effects (in *type 2* and *gestational*). Both lead to hyperglycemia, which largely causes the acute signs of diabetes: excessive urine production, resulting compensatory thirst and increased fluid intake, blurred vision, unexplained weights loss, lethargy, and changes in energy metabolism. Diabetes is important

health problem. The infections by a syringe, insulin pump, or insulin pen deliver insulin, which is a basic treatment, exercise, meditation and insulin supplementation.

EXPERIMENTAL

Collection of Plant Material from different parts of South India and its Authentication was done. Aqueous Extract of *Morinda citrifolia* was procured from Mithali Herbal Extracts Vijayawada Andhra Pradesh INDIA Aqueous Extract and Crude dried powder of fruit of *Morinda citrifolia* is screened for Phytochemical and Antidiabetic activity on Rats.

Phytochemical investigation of *Morinda citrifolia* fruit Extract and Powder

Phytochemical tests were carried out to find the presence of chemical constituents in crude dried

powder. Alkaloids, Carbohydrates, Proteins, Flavanoids, Glycosides, Fats, Steroids, Triterpenoids and Tannins were tested in fruit powder and extract of *Morinda citrifolia* according to the standard procedures.

Animals: Sprague dawley rats weighing between 200-250g were maintained under standard laboratory condition on 12-day/night cycle with free access to food and water being available. The animals were acclimatized to laboratory condition prior to experimentation. The animals were drawn at random for the study. All the experiments were performed according to current guidelines for the care of the laboratory animals and the ethical guidelines.

Acute oral Toxicity study of Aqueous Extract of fruit of *Morinda citrifolia*

The Sprague dawley rats treated with aqueous extract of *Morinda citrifolia* did not show any behavioral changes, toxic reaction or mortality up to 5000 mg/kg treatment. It was found to be safe at the dose of 5000 mg/kg. Therefore, LD50 of the aqueous extract of *M. citrifolia* was found to be >5000 mg/kg.

SCREENING OF ANTI DIABETIC ACTIVITY

Evaluation of Anti diabetic Activity in Glucose over loading induced diabetes method

EXPERIMENTAL DESIGN

Sprague dawley rats of either sex being 200-250gm were selected and divided into 4 groups of 6 animals each. All the animals used were fastened overnight before administration of extract with glucose. After administration of extract and/or glucose. Till the end of the experiment they were not free excess to water and food.

Group1: Normal, Control

Group2: Glucose overloading diabetic control (2gm/kg body weight) – Oral route

Group3: Standard (Metformin) 125 mg/kg body weight.

Group 4: 225mg/kg body weight-Oral route Aqueous extract of *Morinda citrifolia* fruit 200mg/kg body weight.

Effect on Blood glucose levels when extract were administered simultaneously with Glucose.

Blood collected from tail vein of the rat were analysed for glucose using the ACCU-CHEK Active sensor glucometer at 0, 15, 30, 60, 90 minutes after treatment with glucose and extract.

STATISTICAL STUDIES

The data obtained by various parameters were statistically evaluated by one way analysis of variance (ANOVA) followed by Dunnett's T test using Graph Pad Prism software (Trial version). The mean values of \pm SEM calculated for each parameter.

RESULTS AND DISCUSSION

DETERMINATION OF BLOOD GLUCOSE LEVEL

The AFMC showed a significant reduction in blood glucose level from 30min onwards when compared to control group of animals. The changes in glucose reduction in blood in all groups of animals were given in following table. Effects of *Morinda citrifolia* fruit extract on Oral Glucose tolerance in rats. The Indian systems of medicine *Morinda citrifolia* were used – fruits laxative, hypertension, boils and carbuncles, stomach ulcers, toothaches, sore throat, cuts and wounds; abscesses; mouth and gum infections, tuberculosis, sprains, deep bruising, rheumatism. It also used in various tribal areas for fever, eye problems, skin disorder, gums and throat complaints, gout, asthma, urinary disorders and menstrual cramps. But pharmacological scientific evidence for its antidiabetic activity yet to be proved or not yet proved shown based on above literature. It can be evaluated for antidiabetic of *Morinda citrifolia* fruit extract in overloading glucose induced diabetes model. The glycogen content of skeletal muscle and liver which is markedly decreased in diabetes that is due to decrease in the utilization of glucose. The glucose tolerance significance the ability of body to dispose of additional glucose entered into the body. It is useful in distinguishing in a person with normal glucose tolerance with impaired glucose tolerance namely diabetic. The increase in blood sugar levels after glucose loading is sharp and the magnitude of increase generally greater than normal ones. In present study, the treatment with AFMC tolerated by the animals compared with that of normal untreated animals.

Table 1: Evaluation of Anti diabetic Activity in Glucose over loading of Extract of *M.citrifolia*

Group	Treatment (dose/kg body wt)	Blood Glucose(mg/dL)				
		Fasting	30min	60min	90min	120 min
1	Normal	93.4±0.9916	92.4±.2622	88.4±0.2832	90.4±.1326	
2	Glucose 2g/kg	92.4±0.7915	130±1.921	123.12±1.537	120.19±1.221	116±.8911
3	Glucose 2g+Metformin	94.5±0.2211	114±.825*	109.92±1.237*	93.13±0.911*	86±.7361**
4	Glucose 2g+aqueous extract 200mg/kg	90.5±0.5622	119.83±.621**	111.17±0.822**	108.06±1.738**	100±.6642**

CONCLUSION

The present study was an attempt to investigate to determined antidiabetic activity using glucose overloading induced diabetes. The animal diabetes induced with glucose overloading method and the animals were treated with AFMC before glucose overloading, after that the blood glucose levels are shown significant antidiabetic activity.

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