Uttar Pradesh J. Zool. 32(2) : 249-251, 2012 ISSN 0256-971X

ANTIDIABETIC AND HAEMATINIC EFFECTS OF TRIGONELLA FOENUM-GRAECUM (FENUGREEK) IN ALLOXAN INDUCED DIABETIC ALBINO RATS

SANJEEV KUMAR, KUMARI SHACHI, KUSHAGRA KUSH AND N.K. DUBEY
UNIVERSITY DEPARTMENT OF ZOOLOGY,
LALIT . NARAYAN MITHILA UNIVERSITY
DARBHANGA-846 004, INDIA.
(e-mail : dnagina@gmail.com)

Diabetes is a malady. Use of medicinal plants in the treatment of various diseases has been widely recognized recently. In the present study an effort has been made to investigate the antidiabetic & haematinic effects of *Trigonella foenum-graecum* on alloxan induced experimental animal model. A significant rise in the blood glucose level was recorded in diabetic Vehicles when compared to normal experimental rats. Antidiabetic and haematinic activity was observed in fenugreek fed rats on 1st, 7th, 14th & 21th days post treatment. Antidiabetic effect of fenugreek was found less effective than that of standard treatment group. It is hoped that application of fenugreek will be greatly helpful in the therapeutic measures to be adopted for diabetic model.

Key words :- Trigonella foenum-graecum, Diabetes, Alloxan, Hb, Blood glucose.

INTRODUCTION

Diabetes is the endocrine disorder that creates homeostatic chaos. According to WHO report, India has 19.4 million diabetic patients (King *et al* ; 1998). Several plant extracts are known for their antidiabetic properties (Sarvanan & Leelavinothan, 2006). There is a growing interest in herbal remedies for diabetes, due to their availability & lesser said effects. Fenugreek is a seasonal herbal plant growing up to 0.5 m in length. It is cultivated all over India. Its seeds are used for their carminative, tonic & aphrodisiac effects.

In the present study an effort has been made to assess the antidiabetic properties of fenugreek in experimental rats.

MATERIALS AND METHODS

Plant seeds of *Trigonella foenum-greacum* were procured from local market of Darbhanga. (Bihar)

Albino rats (200-210g) were used as experimental animals. Animals were procured from local supplier.

The rats were acclimatized for 7 days. All the animals were fed with Rodent Pellet diet. Water was allowed *ad-libitum* under strict hygienic condition.

Induction of Diabetes : Alloxan-monohydrate is a toxic glucose analogue which selectivety destroys insulin producing cells in the *pancreas.* This causes insulin dependent Diabetes *called* "Alloxan diabetes" (Lenzen, 2008).
Alloxan monohydrate was obtained from Explicit chemical Pvt. Ltd. Pune (India)

Experimental Design :

Group A	Normal control
Group B	Normal control + Extract treatmentt
Group C	Alloxan induced (vehicles)
Group D	Alloxan + Standared treatment
Group E	Alloxan and Extract treatment

Antidiabetic : The diabeties was induced in 18 hr lasted animal by a single intra peritoneal injection of freshly prepared solution of Alloxan monohydrate (120 mg/kg body weight in 0.5 ml normal saline water).

After 72 hr of Alloxan injection the diabetic rats (glucose level < 285 mg/dl) were separated. Treatment was started except in normal control and diabetic vehicles (Alloxan induced) animals. During further investigation all experimental group animals were given standared hygienic water and diet.

RESULTS AND DISCUSSION

A significant rise in fasting blood glucose level was recorded in diabetic vehicles when compared to normal control rats. Antidiabetic activity was recorded in fenugreek fed rats on 7^{th}, 14^{th} & 21^{th} day post treatment. The haemoglobin concentration of untreated diabetic rats was also significantly lower than that of other groups. It was also lower than that of the diabetic animals treated with extract & those treated with standard treatment group. The results are shown in Table I & II.

Table I ; Antidiabitic effect of fenugreek treatment.

Animal : Albino Rats Alloxan : 120 mg/kg I.P.

	Experimental Group	Fasting blood glucose (mg/dl)			
		0 day (basal valve	7^{th} day	14^{th} day	21^{st} day
A	Normal control	94.45±3.80	96.82±3.92	96.7±1.73	92.29±3.44
B	Normal control + Extract treatment	94.55±4.12	94.88±1.54	95.17±1.72	96.29±3.17
C	Alloxan induced (Vehicles)	290.45±2.27	300.91±2.05	300.91±5.05	298.41±2.85
D	Alloxan std. treatment	290.40±2.27 P < 0.001	210.81±2.05 P < 0.001	200.91±3.07 P < 0.001	165.41±2.42 P < 0.001
E	Alloxan + Extract treatment	285.40±2.27 P < 0.001	222.81±2.07 P < 0.001	212.91±2.06 P < 0.001	172.41±2.72 P < 0.001

Values are mean ± S.E.M; n = 8; P < 0.001; Vs = Diabetic control

Fenugreek was found less effective than that of the standard treatment group. The result of the present investigation indicate that fenugreek seeds have the property to lower the blood glucose levels. Alloxan monohydrate facilitates the production of free radicals & cause tissue damage. The pancreas is especially susceptible to such damage. It appears from the present investigation that the fenugreek seeds might have tissue reparable and restorative capabilities. Jeppesen *et al.*, (2003), Raskovic *et al.*, (2004) and Change *et al.*, (2005) have also observed reduction in blood glucose level following administration of stavia leaves. Finding in this regard with methi and talekucha were also no different..

Table II ; Haematinic effect of fenugreek treatment.

Animal : Albino Rats Alloxan : 120 mg/kg I.P.

	Experimental Group	Blood haemoglobin (mg/dl)			
		0 day (basal valve	7^{th} day	14^{th} day	21^{st} day
A	Normal control	15.9±52	16.00±0.02	15.8±0.52	15.9±0.45
B	Normal control + Extract treatment	16.4±60	16.7±0.45	16.9±0.47	16.8±0.42
C	Alloxan induced (Vehicles)	14.0±40	14.2±0.20	13.9±0.47	14.9±0.52
D	Alloxan std. treatment	15.0±42	15.9±0.45	16.0±0.12	16.8±0.17
E	Alloxan Extract treatment	16.5±45	16.7±0.95	16.5±0.14	16.9±0.28

Values are mean ± S.E.M; n = 8, $P < 0.001$ Vs = Diabetic Control

Chowdhury *et. al*; (2005) has also reported the reduction of blood glucose following administration of "methi" seed extract.

Findings in the present study too are in accord with the findings discussed above Fenugreek has been widely used for curing various maladies. Present investigation will be helpful in establishing a scientific basis for antidiabetic and haematinic uses of fenugreek seed. However, much more studies are still required to explore the other potential of this plant. *vis-à-vis* their therapeutic values for treating diabetes and other related maladies.

ACKNOWLEDGEMENT

Thanks are due to Head, Department of Zoology, LNM University, Darbhanga for providing lab facilities. Free samples provided by Mr. Dinesh Munot of Explicit Chemical Pvt., Pune is also thankfully recorded.

REFERENCES

CHANGMU, M, LIU, I.M. & CHENG, J.T. 2005. Increase of insulin sensitivity by stevioside in frucotoserich chow-fed rats. *Horm Metab Res.* **37** : 610-616.

CHOWDHURY, M.E. 2005. Antidiabetic Effect of *Azadirachta indica, Trigonella foenum-graecum, olea europea* and Glibenclamide in Experimentally Diabetic induced rat. *M.S Thesis, Department of Pharmacology, Bangladesh Agricultural University.*

JEPPESEN, P.B., GREGERSEN, S., ROLFSEN, S.E., JAPSEN, M., COLOMBO, M., AGGER, A., XIAO, J., KRUHOFFER, M., ORNTOFT, T. & HERMANSEN, K. 2003. Antihyperglycemic and blood pressure reducing effects of stevioside in the diabetic Got-kakizaki rat. *Matabolism.* **52** : 372-378.

KING, H., AUBERT, R..E. & HERMAN, W.H. 1998. Global burden of diabetes, 1995-2025 Prevelence, numerical estimalion and projection. *Diabetes care.* **21** : 414-1431.

LENZEN, S. 2008. The mechanism of alloxan and streptozotocin induced Diabetes. *Diabatologica.* **51** : 216-226.

RASKOVIC, A., GAVRILOVIC, M., JAKOVLTEVIC, V. & SABO, J. 2004. Glucose concentration in the blood of intact & alloxan-treated mice after pretreatment with commercial preparations of stevia rebaudiana (Bertoni). *Eur J. Drug metab. Pharmacokinet.* **29** : 87-90.