

Blood Glucose Lowering Effect of 'Ustha', Momordica charantia (small type) in Rats.

*S. M. Keramat Ali, Sheikh Nazrul Islam, Md. Mozharul Huq Chowdhury,
Md. Aminul Haque Bhuyan, Tapas Ranjan Das & Md. Nazrul Islam Khan.*

Institute of Nutrition and Food Science, University of Dhaka, Dhaka, Bangladesh

Introduction

Momordica charantia, linn, (Family: cucurbitaceae) small variety known as 'ustha' in Bangla is consumed as vegetable grown as creepers. This vegetable is indigenous to Bangladesh and is available also in other countries of the world. It is a curminative, tonic, stomacic, astringent to bowels and in many other conditions treated in Ayurvedic system of medicine¹. Aslam and Stockley² reported that M. charantia currey had reduced blood glucose in human. Latherdale et al³ reported that raw and cooked M. charantia (large type), 'Karala' lowered blood glucose level among non-insulin dependent diabetics and non-diabetic laboratory rats. The hypoglycaemic effect of M. charantia (small type) in healthy (non-diabetic) adult Evan rats is being reported in this presentation.

Materials and Methods

Fresh 'ustha' was bought from local market, washed thoroughly in tap water and seeds were removed manually. These seed-removed ustha weighing 250g was then churned in a blender with 50 ml distilled water and kept at room temperature for 24 hours. The extract was then filtered and the filtrate was concentrated to 50 ml under reduced pressure at 35°C. The same procedure was followed for making alcohol extract except using 50 ml alcohol instead of water.

Six healthy non-diabetic rats of 2 months of age on usual diet, constituted the study subjects. The mean weight of rats was 107g (range 95-125g). Blood samples were collected from the tip of tail on a haemogluco-test strip for determination of blood glucose by using Refloulux 11 of Boringher. The estimation was done by glucose peroxidase enzymatic method using reflectance method. Then the rats were divided into two groups having 3 members in each group. Each rat was given forced gastric feeding of the extracts according to its weight. This was calculated as proportionate feeding of 10 ml extract per kg body weight of the rat. After two hours, blood glucose levels were measured using the same method.

Results

The results are described in the following tables.

Table 1 shows the individual weight of rats and the dose of forced feeding given to rats of both aqueous and alcoholic extract groups.

Table 2 shows the blood glucose level of rats before and after 'ustha' extracts feeding. There is overall reduction of blood glucose levels after 2 hours of feeding. However, statistically these were not significant using 't' test. It can be noticed here that two rats taking aqueous extract did not show any lowering of blood glucose level, may be due to individual variations.

Discussion

Blood glucose lowering properties of Momordica charantia (ustha) has been observed. Gupta and Seth⁴ however showed that extracts of M. charantia (large type) do not decrease intestinal

absorption. The raw alcoholic extract had pronounced hypoglycaemic effect which was also observed by Letherdale et al in 1980³ in M. charantia (large type).

Letherdale also observed that there was no rise in insulin. So its action was on liver and peripheral glucose utilisation.

'Ustha' being a member of the same family, except smaller in size, showed glucose lowering effect in this study. As 'ustha' is used as vegetable having no known harmful side effects, this may be a promising vegetable for lowering the blood glucose level of uncomplicated diabetics.

Table 1. Forced feeding of M. Charantia by weight of rats

Feeding type	Rat no.	Aqueous extract			Alcohol extract		
		1	2	3	1	2	3
Weight of rats (gms)		95	95	115	105	110	125
Dosage of extracts (ml)		0.95	0.95	1.15	1.05	1.10	1.25

Table 2. Comparison of blood glucose at two hours after forced feeding of M. Charantia

Rat No.	Aqueous extract			Alcohol extract		
	1	2	3	1	2	3
Blood glucose before feeding (mmol/l)	4.3	4.3	3.8	4.6	4.5	3.2
2 hours after extract feeding (mmol/l)	4.3	3.7	3.9	3.9	3.9	2.4

t=0.653,

t =0.944,

P <.05

P<. 05

Not significant with Aqueous extract

Not significant in Alcoholic extract

References

1. Kirtikar, K. R. and Basu, B.D.: Indian Medicinal Plants. Bishen Singh, Mahendra Pal Singh, Dehra Dun, Vol. II, 1130, 1980.
2. Aslam, M. and Stockley, I. H. Interaction between curry ingredient (karala) and drug (chlorpropamide). The Lancet, 607, March 17, 1979.
3. Letherdale, B.A.; Panesar, R. K.; Singh, G.; Atkins, T. W.; Bailey, C. J. and Bignell A. H. Improvement in glucose tolerance due to Momordica charantia (Karala). Brit. Med. Jour. 202, 1823, 1981.
4. Gupta, S. B.; Seth, C. B. Effect of Momordica Charantia Linn (karala) on glucose tolerance in albino rats. J. Indian Med. Assoc. 39:5814, 1962.