

## LETTER TO THE EDITOR

### HYPOGLYCAEMIC ACTIVITY OF ACACIA ARABICA, ACACIA BENTHAMII AND ACACIA MODESTA LEGUMINOUS SEED DIETS IN NORMAL YOUNG ALBINO RATS

Sir,

The role of dietary proteins and fats influencing the glycaemia has received much attraction in recent years and it has been observed that the quantity and quality both effect the blood glucose concentration in experimental animals and man. We have investigated the effect of *Acacia arabica*, *Acacia benthamii* and *Acacia modesta* seed protein diets on blood sugar level in normal young rats.

Male young albino rats weighing, 70 to 100 g were divided into four sub groups designated as A<sub>1</sub>, B<sub>1</sub>, C<sub>1</sub>, D<sub>1</sub> and A<sub>2</sub>, B<sub>2</sub>, C<sub>2</sub>, D<sub>2</sub> consisting of eight rats each. The diet was given *adlib*.

Group I of normal rats: Animals of sub-group A<sub>1</sub>, were fed on normal laboratory stock diet. Laboratory stock diet consisted of glucose 300 g, starch 200 g, coconut oil 100 g, casein 200 g, Agar Agar 140 g, salt mixture 40 g, vitamin mixture 20 g, per kg. Salt mixture was prepared according to Hawke *et al.* (1). One gram of vitamin mixture contained, thiamine 0.6 mg, calcium pento-thenate 4.0 mg, ribo-flavin 1.2 mg, pyridoxin 0.4 mg, niacin 5.0 mg, P-amino-benzoic acid 2.5 mg, inositol 200 mg, choline-chloride 200 mg, biotin 1 mg, folic acid 1 µg, cynocobalamin 10 µg, vitamin A. 2000 units, tocopherol 12 mg, ascorbic acid 20 mg. The animals of sub-groups B<sub>1</sub>, C<sub>1</sub> and D<sub>1</sub>, were fed on experimental diet of *Acacia arabica*, *Acacia benthamii* and *Acacia modesta* seeds separately for one week. The experimental seed diet consisted of whole seed powder (94%), salt mixture (4%) and vitamin mixture (2%). In sub-group B<sub>1</sub>, C<sub>1</sub> and D<sub>1</sub>, whole seed powder was of *Acacia arabica*, *Acacia benthamii* and *Acacia modesta* seeds respectively.

In the second group of animals diabetes was produced by giving subcutaneous injections of alloxan (2 per cent solution in alcohol) in doses of 175 mg per kg body weight.

Rats were fasted over night and were not given any thing except water. In the morning blood was taken out directly by heart puncture and collected separately in tubes containing sodium flouride for glucose estimation. The blood sugar was determined according to the technique of Asatoor and King (1954) as described by Varley (2).

The mean value of blood sugar content of the fasted albino rats maintained on laboratory stock diet for one week was found to be  $80.52 \pm 9.65$  mg per 100 ml as shown in Table 1. In the

batches of rats which were kept on experimental diets of *Acacia arabica*, *Acacia benthami* and *Acacia modesta* seeds separately for one week, there was a lowering of blood sugar level by 29.99, 27.68 and 25.05% respectively ( $P < .01$ ).

When maintained on laboratory stock diet for one week, mean value of fasting blood sugar of diabetic rats was found to be  $176.37 \pm 7.92$  mg. per 100 ml. In the diabetic albino rats of sub groups B<sub>2</sub>, C<sub>2</sub>, D<sub>2</sub> which were fed on experimental diets consisting of *Acacia arabica*, *Acacia benthami* and *Acacia modesta* seeds separately for one week, there was an insignificant decrease in blood sugar level by 3.69%, 2.24% and 2.14% (Table I) respectively ( $P > .01$ ).

TABLE I: Blood sugar level after 24 hours fasting normal and diabetic albino rats fed on *Acacia arabica*, *Acacia benthami* and *Acacia modesta* seed diet.

Group*	Blood sugar level in normal rats (mg/100 ml whole blood) (Mean value $\pm$ SD)	Percentage lowering	Group	Blood sugar level in diabetic rats (mg/100 ml whole blood) (Mean value $\pm$ SD)	Percentage lowering
A <sub>1</sub>	80.42 $\pm$ 9.65	—	A <sub>2</sub>	176.37 $\pm$ 11.94	—
B <sub>1</sub>	56.37 $\pm$ 8.76	29.99	B <sub>2</sub>	169.85 $\pm$ 11.46	3.69
C <sub>1</sub>	58.23 $\pm$ 9.35	27.68	C <sub>2</sub>	172.32 $\pm$ 10.92	2.24
D <sub>1</sub>	60.35 $\pm$ 8.46	25.05	D <sub>2</sub>	172.59 $\pm$ 12.16	2.14

Group*	=	Laboratory stock diet
A <sub>1</sub> , A <sub>2</sub>	=	Acacia arabica seed diet
B <sub>1</sub> , B <sub>2</sub>	=	Acacia benthami seed diet
C <sub>1</sub> , C <sub>2</sub>	=	Acacia modesta seed diet
D <sub>1</sub> , D <sub>2</sub>	=	

In the present study all the three leguminous seeds have been shown to exhibit hypoglycaemic effect in normal rats but they did not show any significant hypoglycaemic effect in alloxanised diabetic rats. It is likely that hypoglycaemic effect of these legumes is due to their direct or indirect stimulation of  $\beta$ -cells of islets of Langerhans to secrete more insulin. In alloxanised rats since  $\beta$ -cells of islet of Langerhans are destroyed there was no hypoglycaemic effect observed when the animals were fed on leguminous seed diets. The possibility that the experimental diet, 90% of which consisted of the legumes was responsible for the results cannot be overlooked.

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