

Experimental

STUDIES ON THE HYPOGLYCEMIC ACTIVITY OF THE BARK OF FICUS BENGALENSIS EMPLOYING ALLOXAN-RECOVERED RABBITS**

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Ficus bengalensis is a medicinal plant reputed for antidiabetic properties in the traditional medicine of India. The bark of this plant was subjected to studies for hypoglycemic activity by some earlier investigators¹⁻⁵ and Augusti⁵ isolated one acetone insoluble glucoside from the alcoholic extract of the bark and designated it as Bengalinoside.

Most of the earlier investigators employed alloxan diabetic rabbits with elevated fasting blood glucose levels (FBG) in their studies on the hypoglycemic activity of medicinal plants. However, the diabetic state in these animals is unstable and animals with the FBG levels 400 mg% and above do not respond to agents acting at the pancreatic site.

After treatment with alloxan, a small proportion of rabbits recover from their fasting hyperglycemia in about a months time. Duff and Mcmillan⁶ designated these rabbits as "Alloxan-recovered" (A.R.). In our studies⁷ we

Table 1
Effect of Ethanol Extract on GTT Pattern of AR Rabbits

Time in minutes	Blood sugar (mg%) mean \pm (S.D.)		
	Untreated (n:9)	Treated (n:9)	
	(n:9)	Improved (n:6)	Not responded (n:3)
Fasting	80.2 \pm 22.2	110 \pm 15	119.3 \pm 28.3
30	188 \pm 27.1	215 \pm 11.2	289 \pm 44.6
60	222.5 \pm 22.4	260 \pm 11.1	302.6 \pm 39.8
90	255 \pm 23.7	257 \pm 17.4	363.6 + 14.3
120	271 \pm 20.8	186.2 \pm 29.4	361 \pm 8.6
150	219 \pm 28.8	142 \pm 15.7	310.6 \pm 35.5

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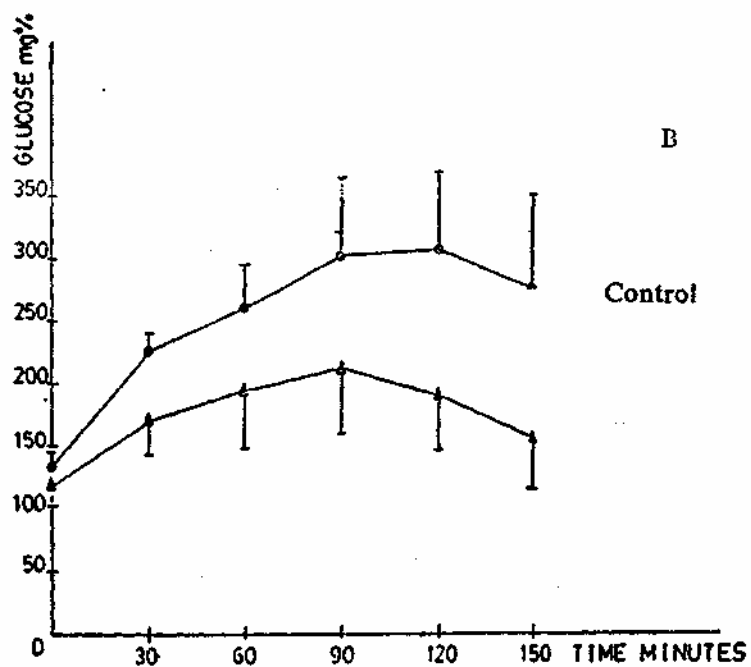
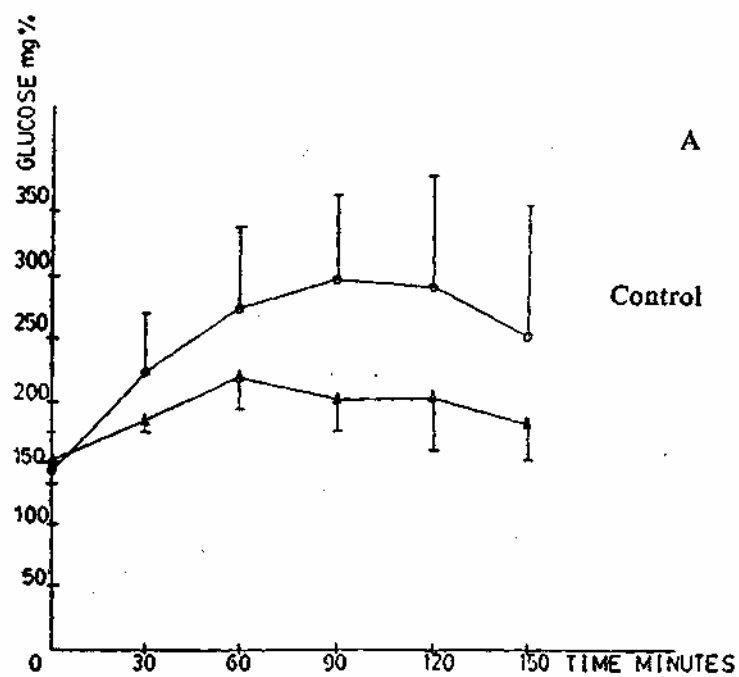


Fig. 1. Effect of tolbutamide (3 gm/kg) (a) and the silica gel fraction (50 mg/kg) (b) on the glucose tolerance of alloxan-recovered rabbits.

found these rabbits to maintain normal or near normal FBG levels with impaired glucose tolerance. AR rabbits were employed in our studies on the hypoglycemic activity of *Ficus bengalensis* as their milder state of diabetes provided a sensitive assay method for hypoglycemic activity⁷.

The alcoholic extract of the bark in a dose of 1g/kg produced varied effect on the glucose tolerance of AR rabbits (Table-1). On the other hand, the acetone extract which is relatively pure (acetone dissolves only a small fraction of the alcoholic extract⁸) produced significant hypoglycemic effect uniformly in all the AR rabbits, at a dose of 130 mg/kg body weight.

The acetone extract was further purified by adsorption chromatography on a silica-gel column. A 10 fold purification was achieved in this step with the activity remaining in the fraction eluted by acetone. This fraction designated as silica gel fraction, improved the glucose tolerance of AR rabbits at a dose of 50 mg/kg body weight. The effects of tolbutamide, and the silica gel fraction on the glucose tolerance of AR rabbits are compared in Fig 1. The results show that the partially pure fraction is several times more active than tolbutamide. The solubility properties (acetone soluble and water insoluble) show that it is chemically different from Bengalinoside⁵ which is acetone insoluble and only mildly hypoglycemic.

In summary, *Ficus bengalensis* is one of the medicinal plants of India which is reputed for antidiabetic properties and subjected to several studies for hypoglycemic activity. But all the compounds reported so far from this plant source were only mildly active and all of them were less potent than tolbutamide.

In our preliminary studies employing AR rabbits, the crude extracts of the bark were found to produce pronounced hypoglycemic effect. Further studies on this plant source were therefore undertaken with the hope of obtaining compounds with higher degree of activity. The partially purified compound reported here was several times more active than tolbutamide. The solubility properties show that it is chemically different from all the other compounds reported so far from this plant source.

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