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Research Article

HYPOGLYCEMIC EFFECTOF TINOSPORA CORDIFOLIA ON SWISS ALBINO MICE

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ABSTRACT
The aim of the present study is designed to investigate the hypoglycemic effect of root extracts of *Tinospora cordifolia* in normal swiss albino mice Balb C strain. *Tinospora cordifolia* commonly known as "Guduchi" showed signification reduction in blood sugar level in both normal and Allaxon induced Diabetic mice. The mice weighing 20.0-30.0g were administered orally with the alcoholic root extract of *Tinospora cordifolia* with a single dose of 200mg/kg body weight from a period of Day 1 to 30 days. It produced significant decrease in the levels of blood glucose. The results showed that the root extract of *Tinospora cordifolia* is pancreatoprotective and is hypoglycemic in nature.

Key Words: *Hypoglycemic, Tinospora cordifolia, Mus musculus, BalbC, Pancreatoprotective*

INTRODUCTION
Diabetes mellitus is a worldwide chronic disease of humans related with the elevated blood sugar level due to insulin deficiency. The patients of the disease belong to both male and female equally and to all age groups. Diabetes can genetic or acquired or by the combined effect of the two which hinders the production of insulin. India is one of the major countries in terms of Diabetic patients. The whole South East Asia and Africa have ever increasing population of diabetes.

Diabetes is broadly classified in to insulin dependent, in which the patients pancreas is not able to synthesize and secrete insulin and insulin independent in which the body cells do not possess normal receptors for insulin. They are also called as Type-1 and Type-2 Diabetes respectively. Both the types are characterized by high blood glucose level in the blood resulting in Polyuria, Polydypsia and Polyphagia. The therapeutic remedies of Diabetes cover a vast region of the healthcare market. Though there are so many hypoglycemic medicines are available in the market but the demand of natural remedies still persists. This is due to the avoidance of side effects posed by these synthetic agents and the price related issues.

In India and other countries the Herbal treatment of various diseases has a long-long history. Several plants are used for treatment of various diseases. These are natural and do not have any synthetic compounds that may harm the health of the consumer. Due to low cost the herbal medicine are widely used by different commodities. The hypoglycemic nature of *Dodonaea viscose* was well reported in rats (Aswal *et al.,* 1984). *Tinospora cardifolia* also known as Guduchi, Giloy is well known for its heptoprotective and immunomodulatory activities (Rege *et al.,* 1993). It is a climbing shrub commonly present on the trees of mango and neem. It showed signification reduction in blood sugar level in both normal and Allaxon induced Diabetic mice. In Indian medicine it is widely used for treating diabetes (Stanley and Menon, 2001). The extract of plant parts decreases the blood sugar level (Roman *et al.,* 1992 and Chattopadhyay, 1999). The aim of present study is to investigate hypoglycemic effect of extract of the roots of *Tinospora cordfolia* in normal Swiss Albino Mice of the Balb C strain with a fixed dose of 200mg/kg body weight.

MATERIALS AND METHODS
Collection of Plant Material and Extraction

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The hanging roots along with the plants of *Tinospora cordifolia* was collected from the trees of Mango and Neem from Bhagalpur area in the month of April and identified. The roots were washed properly and dried in shade. The methanolic extract of roots was prepared using the standard protocol.

Model Organism

The model animal Mus musculus strain balb C mice were collected from the Department of Zoology, animal house, T.M. Bhagalpur University, Bhagalpur. The Healthy mice weighing 20.0-30.0g irrespective of sex were used for the experiment. They were maintained under a controlled day night (12:12h) schedule at 25±1ºC. The animals were fed on solid diet and water ad -libitum. The experiments were carried out in between 4 to 5p.m. After a week of acclimatization to laboratory conditions the animals were used for different sets of experiments Approval of Institutional Ethical Committee was sought prior to the commencement of experiment.

Experimental Groups

The experimental animals were divided into two groups. Group A consisting of albino mice as control. The control animals were fed on distilled water. Group B consisting of normal albino mice as experimental animals. They were treated with the alcoholic extract of *Tinospora cordifolia* with a dose of 200mg/kg body weight by oral administration. The blood samples were collected for determination of blood glucose by using BOD-POD with Nelson-Somogyi's method (Somogyi, 1945).

RESULTS AND DISCUSSION

The result of experiments has been shown in Table-1, where the experimental animals were treated with root extract of *Tinospora cordifolia* and their blood glucose levels were determined. The blood glucose levels were estimated on various days starting form day '0'up to 30th day. The control group revealed blood glucose variations between 120 and 110mg/dl while the experimental group indicated variations between 91 to 145mg/dl the blood concentrations (figure 1). The simple regression shows (figure 2) the significance of test conducted. The result showed that there was a significant decrease of blood glucose level for all the days except Day-1 to Day-4 (Table 1). It is also evident from Table1 that the blood glucose in the experimental mice showed a decreasing trend with gradual decline with respect to time, while during corresponding days the control group exhibited a fairly similar concentration.

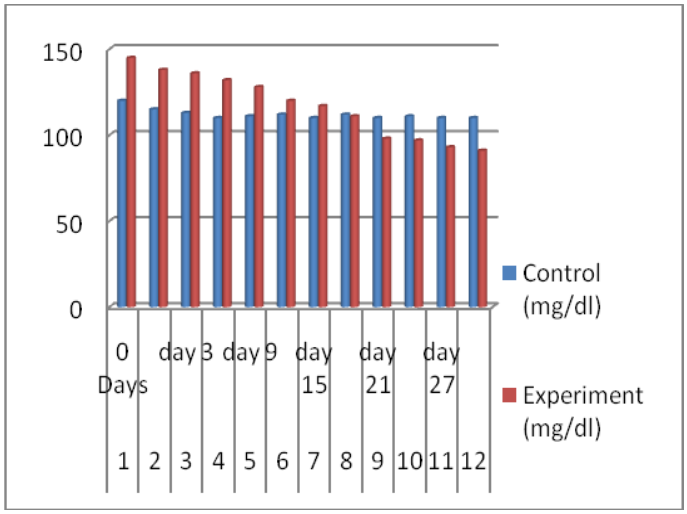

Figure 1: Graph showing Blood Glucose Level in Control and Experimental groups

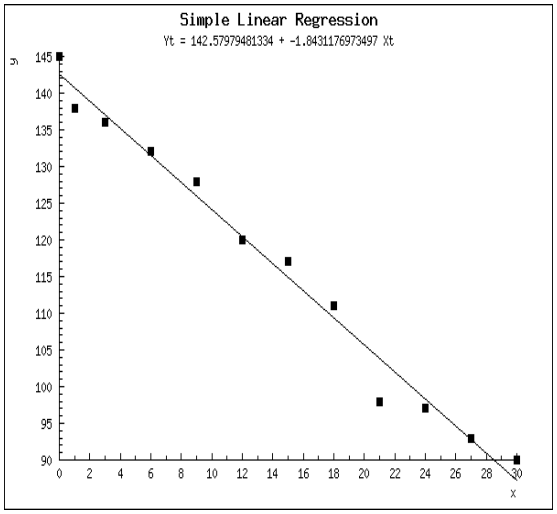

Figure 2: Simple linear regression graph

Table 1: Showing Blood Glucose Level in Control and Experimental groups

S.No.	Duration	Control (mg/dl)	Experiment (mg/dl)
1	0 Days	120	145
2	day 1	115	138
3	day 3	113	136
4	day 6	110	132
5	day 9	111	128
6	day 12	112	120
7	day 15	110	117
8	day 18	112	111
9	day 21	110	98
10	day 24	111	97
11	day 27	110	93
12	day 30	110	91

The hypoglycemic effect of alcoholic root extract of *T. cordifolia* with a dose of 200 mg/kg body weight administered orally to the Allaxon treated hyperglycemic mice once in a day for 4-weeks caused significant lowering of blood sugar level. However, there are various plants which show the antidiabetic property such as *Tinospora cripsa* (Noor and Ashroff, 1989). *Momordica charantia*, *Eugenia jambolina*, (Rathi *et al.*, 2002). The present investigation confirmed the pancreatoprotective, pancreatoregenerative and antidiabetic activity of alcoholic root extracts of *Tinospora cordifolia* in diabetic mice as the extract produced significant decrease in blood sugar concentration with a dose of 200mg/kg body weight of normal mice.

Conclusion

The biochemical and histological findings of the root extract on hypoglycemic effect on pancreas can further provide the clear conclusion. Presently, the conclusion is that the possible use of these easily available, herbal and non-hazardous natural remedies for the treatment of diabetes mellitus may further be explored.

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