



## Hypoglycemic Activity of *Tinospora sinensis* (Linn) leaves

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### ABSTRACT

*Tinospora sinensis* (Linn) belongs to Family *Menispermaceae* is traditionally used for the treatment of jaundice, liver diseases, and skin diseases. Apart from traditional use plant is also used for the treatment of diabetes. Ethyl acetate extract of the leaves were studied for hypoglycemic activity on wistar rats using alloxan induced method. Glibenclamide was used as reference standard. The present studies indicate that ethyl acetate extract of leaves of *Tinospora sinensis* Linn. Possess significant activity.

**Key words:** *Tinospora sinensis* (Linn.); Hypoglycemic Activity, Glibenclamide

### INTRODUCTION

Diabetes is a disorder from ancient civilization. In 600B.C. Ayurveda sushruta had describe 20 different types of diseases called 'pramehas' sushruta clearly describe urine is sweet the condition called as Madhumeha.<sup>1</sup>

Greek and Roman physician used the term 'diabetes' to refer the condition which chiefly encompassing a large urine volume and classified it in to two types.

a) Diabetes Mellitus

b) Diabetes Insipidus.<sup>2</sup>

Diabetes characterized by symptom like polyuria loss of weight increase in thirst because of insulin deficiency<sup>4-6</sup>. Diabetes is chronic metabolic disorder affecting 5.4% population world wide<sup>7</sup>. Natural product serve as a major source of drug for centuries and most of pharmaceuticals in use are derived from natural product, the use of natural agent to control different ailments is a centuries old practices that has generally led to discovery of modern pharmaceuticals<sup>8</sup>

*Tinospora sinensis* (*Menispermaceae*) found in native to south and southeast Asia, Nepal, Srilanka and Bengal. Parts used for medicinal purpose are stem, leaves, root, and whole plant. The mature stem of the plant has tonic and stomachic properties it is also used to treat fever, jaundice and burning sensation. The whole plant is reportedly used in Cambodia to treat piles and ulcerated wound. In china the fresh leaves and stem are used in the treatment of chronic rheumatism.<sup>9</sup>

### MATERIAL & METHODS:

#### Plant Material:

Fresh Leaves of *Tinospora sinensis* (Linn) was obtained and identified with authentic source. A voucher specimen has been identified and deposited at the department of pharmacognosy, Dhule. The Collected leaves was dried in shade, crushed to coarse powder

and used for further studies.

#### Preparation of Extract :

Dried plant material ( 1 kg) were subjected to continuous hot extraction with petroleum ether to remove the oily or the fatty constituents present in the drug for 36 hours. The marc was dried and extracted with ethyl acetate for 72 hours. The Extract was filtered, concentrated and the solvent was removed by rotary evaporator. The extract was dried over a desiccator. The residue (480g) was used for these studies. The extract was subjected to preliminary, qualitative test to identify the various phytochemical constituent present in leaves. It was observe that ethyl acetate extract contained steroids, saponins, tannins and flavonoids.

#### Experimental Animal:

Wistar rats of either sex, weighting between 100-120gm were used for the study. All the animals were housed in animal housed of the institution and were handled in confirmation with ethical guideline. Prior permission from the institutional animal ethical committee, NMU University, Dhule was obtained as per prescribed guideline.

#### Hypoglycemic Activity :

The Hypoglycemic Activity was assessed by alloxan induced method. Wistar rats (100-200gm) were selected, weighed & divided into four groups of six animals each. All these animals were fasted 18 hrs. prior to commencement of experiment but water was provided *ad libitum*. Animal of group first and second received solvent and Glibenclamide (0.09mg/200g) respectively through oral route. Animal of group III & IV, ethyl acetate respectively at a dose of 100/200mg/Kg, in similar manner.

The test dose of ethyl acetate *Tinospora sinensis* and the standard drug were prepared by suspending in 1% gum acacia. The study was carried after 48 hours. Of alloxan administration.



Table.1. Assessment of Hypoglycemic Activity

Time in Hours	Control	Extract		Glibenclamid (0.090 mg/200gm )
		100 mg/kg	200 mg/kg	
0	218.9±0.30	222.9±0.42	218.9±0.37	224.9±0.45
1	220±0.70	227.4±.32	226±0.31	203±0.65
2	221±0.34	201±0.39	189±0.42	181±0.65
4	218±0.75	187±0.71	170±0.83*	131±0.47**
6	219.9±0.43	160±0.42	149±0.66**	113±0.86**
8	219.5±.74	189.02±0.37	177.6±0.29	144±0.16**

\* $p < 0.01$ , \*\* $p < 0.001$  as compared to control, values are expressed as mean  $\pm$  SEM from five observation.

### Assessment of Hypoglycemic Activity:

The Blood glucose level were measured with help of digital glucometer ( Accu Chek) with strips. On the day of study, blood glucose level of all group were recorded, ethyl acetate, glibenclimide were given for respective group. Animal were not allowed to access food pallets during the study. The blood glucose levels of animal in various groups were recorded at 0,1,2,4,6 & 8 hrs. Blood was collected by puncturing tail vein. A drop blood was placed on the reaction strip and was allowed to react from 15 sec. to read the blood glucose level.

### RESULT & DISCUSSION :

Ethyl acetate of *Tinospora Sinensis* at both test doses showed statistically significant increase in blood glucose level. There was a sudden decrease level from 2 hrs. To 6 hrs. After 6 hrs. The glucose level were recorded the initial pretreatment concentration the reduction in the term of percentage were found to be more in 200mgm/Kg then 100mgm/Kg. At the 6<sup>th</sup> hrs. The standard drug showed a gradual decrease in the concentration level after 8 hrs. This was grater then test dose. This mainly due to prolongation of the cells in pancreas which releases a specified amount of insulin. The control group did not show much of the differences in the concentration level of blood glucose. The results are tabulated in Table No. 1.

### CONCLUSION:

Thus it can be concluded that the increased peripheral utilization of glucose via transport of cells, utilization of lever and enhanced insulin are the possible mechanism through which extract produce there effect. Thus hypoglycemic activity of *Tinospora*

*sinensis* (Linn). supports to be better understanding of the scientific justification in the term of traditional system. Further studies can be carried out in order to find the exact moiety/ responsible for the activity.

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