

## HYPOGLYCEMIC EFFECT OF NEEM BARK AND FLOWER ON STREPTOZOTOCIN – INDUCED DIABETES IN MICE

ASHOK PUROHIT AND V. P. DIXIT

*Department of Zoology, Birla College, Kalyan – 421 304 and Department of Zoology, University of Rajsastan, Jaipur – 302 004, India.*

---

**Received: 09 October, 1990**

**Accepted: 13 December 1990**

---

**ABSTRACT:** *Three to six hours after the administration of extracts of neem bark or flower, the blood glucose levels of normal and streptozotocin-induced diabetic mice dropped significantly. However, neem flower possesses stronger hypoglycemic activity than the bark. Hypoglycemic action of these extracts may be due to their metabolic effect on tissue and or due to increase in insulin secretion.*

### INTRODUCTION

**Azadirachta indica** popularly, known as **margosa** or **neem**, belongs to the family Meliaceae. Almost all parts of this tree are used for medicinal purposes<sup>1</sup>. Different parts of neem tree are known to contain over 34 bitter principles<sup>2</sup>. Most of them have nematocidal properties<sup>3</sup>.

Search for natural dietary methods for controlling diabetes mellitus is much active these days. Present study aims to evaluate the glucose level in streptozotocin induced diabetic mice after administration of extract of neem bark or flower.

### MATERIALS AND METHODS

Healthy adult male albino mice of inbred colony weighing 40 – 50 gms. were used. They were maintained on mice feed (Hindustan Lever Ltd.) and water **ad libitum**. Diabetes was induced by a single intraperitoneal injection of streptozotocin. These animals were fed with 50% glucose at

the dose of 2 ml | animal | 5 hours interval up to 24 hrs. After 72 hrs. of streptozotocin injection blood from tail vein was taken in dried oxalate fluoride vials and neem bark and neem flower (50% EtOH extract) were administered (10 mg | mice i.p). Blood samples were taken at 3 and 6 hours and then analyzed by the copper sulphate reduction method<sup>4</sup>. The results were analyzed by student's "t" test. The percentage change in blood glucose was calculated.

### RESULTS AND DISCUSSION

The blood glucose concentration of different groups are tabulated (Table – I). After 3 and 6 hrs. of neem bark neem flower (10 mg) injection 16.21 | 39.62% and 29.12 | 51.39% fall in blood glucose was recorded in normoglycemic mice. Similarly, in the severe hyperglycemic group 53.31 | 54.39% to 69.21 | 70.21 % fall in blood glucose was

recorded after neem bark on neem flowers injection.

Decrease in blood glucose concentration after neem plant material administration may be produced by several mechanisms including decreased synthesis or release of glucose by the liver or increased release of insulin or increased peripheral glucose

utilization<sup>5,6</sup>. It may be suggested that, the hypoglycemic action of neem may be due to its direct effect on the tissue. Neem bark and neem flower possess active hypoglycemic constituents, but neem flower extract possesses stronger hypoglycemic agent than the bark. Further chemical and pharmacological investigations are in progress.

**TABLE 1**  
**Mean blood glucose concentration mg|100 ml ± S. E. after neem bark | neem flower extract administration**

<b>Treatment</b>	<b>-30 min.</b>	<b>+ 3 hrs.</b>	<b>Deviation from – 30 min.%</b>	<b>+ 6 hrs</b>	<b>Deviation from -30min.%</b>
Normoglycemic + Placebo	86.74 ± 1.07	88.32 ± 0.75	1.82 ± 29.90	87.39 ± 0.54	0.74 ± 49.52
Normoglycemic + Neem	91.04 ± 1.71	78.79 ± 4.12	16.21 ± 7.51	62.01 ± 6.21	29.12 ± 12.76
Normoglycemic + Neem flower (10 mg / mice)	89.71 ± 4.01	54.16 ± 8.22	39.62 ± 43.42	43.61 ± 6.67	51.38 ± 33.87
Severe hyperglycemic + Placebo	487.33 ± 17.21	510.71 ± 7.79	5.06 ± 60.12	500.66 ± 31.21	2.94 ± 76.72
Severe hyperglycemic + Insulin (0.1 unit i.p)	504.72 ± 16.21	154.16 ± 18.72	68.94 ± 5.39	127.08 ± 12.02	74.81 ± 32.01
Severe hyperglycemic + Neem bark (10 mg/mice)	565.21 ± 45.21	262.32 ± 42.71	53.31 ± 12.36	190.01 ± 23.73	69.21 ± 53.71
Severe hyperglycemic + Neem flower (10 mg/mice)	572.32 ± 41.01	261.10 ± 30.12	54.39 ± 23.13	130.11 ± 20.72	70.21 ± 51.21

Each mice served as its own control.  
A minimum of ten mice were used in each group.

## REFERENCES

1. Satyawati, G. V., Raina, M. K. and Sharma, M. **Medicinal plants of India**. ICMR 1: 114 – 116 (1976).
2. Rao, N. K and Parmar, B. S. : A compendium of chemical constituents **Neem Newsletter** 1 (4) : 39 – 46 (1984).
3. Vijayalakshmi, K., Gaur, H. S and Goswani, B. K. : Neem for the control of plant parasitic nematodes. **Neem Newsletter** 2 (4) : 35 – 40 (1985).
4. Astoor, N. M. and King, R. S. : Simplified calorimetric blood sugar method. **Biochem. J.** 56 : XLIV (1954).
5. Bhargava, A. K. : Neem oil as a synergist to anti – diabetic drugs for management of secondary hypoglycemia. **Neem Newsletter** 4 (3) : 31 – 32 (1987).
6. Purohit, A. K.: Joshi, V. B. ; Pingle, V. S. and Vyas S. A. : Hypoglycemic activity of Neem seed oil (**Azadirachta indica**) on streptozotocin induced diabetic mice. **J. Diab. Assoc. India** 30 (2) : 36 – 37 (1990).