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Original Article

# Effect of extract of *Pseudocedrela kotschyi* on blood glucose conccentration of alloxan induced diabetic albino rats

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**Abstract:** The effect of extract of *Pseudocedrela kotschi* on blood glucose of alloxan induced albino wistar rats was evaluated. Experimental animals received daily oral administration of extract of *P. kotschi* for 14 days. The effect of 200mg/kg dose was studied during the treatment period. There was a significant reduction in blood glucose concentration ($p < 0.05$) with the mean blood glucose of the different groups having 5.5 + 0.33 for normal control, 7.0 + 0.40 for diabetic control group and 4.8 + 0.24 for diabetic treated group. The findings of this study suggest that extract of *P. kotchi* has hypoglycemic effect.

Key words : *Pseudocedreala kotschi,* hypoglycemia, diabetes, hyperglycemia

## 1. Introduction

Diabetes mellitus is a group of syndromes characterized by hyperglycemia; altered metabolism of lipids, carbohydrates and proteins; and an increased risk of complications from vascular diseases. There are more than 125 million persons with diabetes worldwide today and by 2010 this number is expected to approach 220 million.

On rare occasions, diabetes results from point mutations in the insulin gene. There are genetic and environmental components to both type 1 and 2 DM. Studies of identical twins show 70 -80 % concordance for developing type 2 DM . There is a high prevalence of type 2 DM. The presence of high-titer islet-cell antibodies (ICA) confers a very high risk for the development of type 1 DM in first-degree relatives. Virtually all forms of DM are caused by a decrease in the circulating concentration of insulin (insulin deficiency) and a decrease in the response of peripheral tissues to insulin (insulin resistance). Diabetes mellitus with all its fatal complications (1) is a major public health problem in the developed as well as developing countries. It is a metabolic disease characterized by hyperglycemia and glycosuria due to absolute or relative lack of insulin (2). Diabetes mellitus is further characterized by an inability to reabsorb water resulting in polyuria, polydypsia and polyphagia. It can be complicated disorders of lipid metabolism (3). Medicinal plants with hypoglycemic properties are increasingly been sought for in the treatment of this debilitating condition.

There are over 1000 species of plant, out of which only very few including P. *kotschi,* the plant in this current research effort that have been widely used by traditional healers for the treatment of Diabetes mellitus. *P. kotschyi* is found abundantly in the moisture of heavy soils. It has been used in the treatment of various diseases by traditional healers. Traditional healers have acclaimed its effectiveness when used in the treatment of epilepsy, rheumatism pains, diabetes as well as diarrhea.

Anuka et al (1999) (4) investigated the antiepileptic and analgesic properties of the extract of PK and reported that the extract offers protection against electrically and chemically induced seizures.

This current study therefore is to evaluate the effects of extract of *P. kotschyi* on hyperglycemia induced by alloxan in rats.

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Table 1. Blood glucose levels of diabetic Albino wistar rats after 14 days of treatment with extract of *Pseudocedreala kotschyi*.

| Group | Blood Glucose Level (MMOL/L) | Mean + S.E.M |
|---|---|---|
| 1: Control | 5.6 | |
| | 5.0 | |
| | 5.4 | 5.3 + 0.3 |
| | 5.2 | |
| 11: Diabetic non treated | 7.2 | |
| | 6.8 | |
| | 7.4 | 7.0 + 0.4 |
| | 6.9 | |
| 111: Diabetic treated | 4.8 | |
| | 4.8 | |
| | 4.7 | 4.8 + 0.2 |
| | 4.6 | |

## 2. Materials and methods

Albino rats (12) were obtained from the University Animal House. The animals were kept in large plastic cages and acclimatized for at least two weeks before the commencement of the experiments. The animals were fed with a standard diet of growers mash supplied by Gee Pee Nigeria Limited and had access to clean drinking water *ad libitum.* The fresh leaves of the plant P. *kotschyi* were dried in the open air in a shade for a period of about four weeks prior to extraction process. The water extract of the plant was obtained by decoloration in accordance with the general process described in the USPXII(10) to yield an extract of 4.0%w/v, which was used in the experiment. Normal saline and 5% alloxan monohydrate were purchased from reputable chemical store in Port Harcourt.

Twelve albino wistar rats were used for this study. 2 out of the 3 groups were made diabetic with single dose of alloxan monohydrate 5% (125 mg/kg, I.P) dissolved in normal saline and confirmed on third day post-administration. Fasting blood glucose of the rats were determined at the start and end of the experiment. Treatment was by oral compulsion for 14 days. The animals were grouped as follows:

Group i : Control, given only normal saline

Group ii : Alloxan induced diabetic made with a single dose of alloxan monohydrate 5% dissolved in normal saline (125mg/kg, I.P)

Group iii : Diabetic rats treated with extract of *P. kotschyi* (4.0%w/v).

Blood was collected by cardiac puncture 24 hours after completion of treatment. Blood glucose was estimated by enzymatic colorimetric method.

## 3. Results

Blood glucose concentration of the rats after 4 days of treatment with extract of *P. kotschyi* is as shown in Table 1. There was a significant reduction of the blood glucose levels from a mean value of 7.0 to 4.8.

## 4. Discussion

The blood glucose levels in group iii animals treated with extract of *P. kotschyi* decreased significantly ($P< 0.05$) compared to group 1 control animals and group ii diabetic non-treated animals. The levels in the group iii treated animals returned to normoglycemic values. The results of this current study indicate that indeed extract of the plant *P. kotschyi* possesses hypoglycemic activity and may explain the usefulness of the plant in the treatment of diabetes mellitus by traditional healers. However it is not known how this extract of *P. kotschyi* acts to produce this observed hypoglycemic effect. It is also not known what the toxic side effects of this plant are in its usage. We therefore state that further studies are required to elucidate the toxic effects of this plant as well as identification of the active ingredient responsible for this hypoglycemic action of this plant.

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