

## Haemoglobin Level, Total White Blood Cell and Packed Cell Volume In The Albino Rats Treated With Aqueous Extract Of Fresh Leave Of *Blighia Unijugata*

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**Abstract:** The effect of aqueous extract of fresh leaves of *Blighia unijugata* used in treatment and management of various diseases such as diabetes, hypertension and gastric intestinal disorder on the hematological system was investigated in albino rats. Twenty adult male albino rats were divided into five groups of four rats each. Groups A, B, C and D rats were administered orally with 100.0, 200.0, 300.0 and 400.0mg/kg body weights of the aqueous extract of fresh leaves of *Blighia unijugata* respectively while, group E served as the control and was given only feed and water. The treatment lasted for seven (7) consecutive days. Physical activities and the rates of consumption of feed and water decreased in the animals administered the extract compared to the control. The result shows that administration of extract of fresh leaves of *Blighia unijugata* increased hemoglobin level (HB), total white blood cell (WBC) and packed cell volume (PCV) in the test groups compared to the control. This could be the reason why the extract is used in ethno-medicinal practices to fight against invading diseases.

**Keywords:** *Blighia unijugata*, diabetes, hypertension, gastric intestinal disorder and albino rats.

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### I. Introduction

Medicinal plants are herbal preparations used for the treatment of various diseases or which are source for the synthesis of drugs (Elujoba *et al.*, 2005). In Nigeria many medicinal plants are reservoirs of natural products with anti-diabetic potentials (Gbolade A.A 2009).

Okpocha (*Blighia unijugata*) found in Nigeria and also naturalized in most of tropical and subtropical regions are of great medicinal values. The chemical constituents contain many biologically active compounds that can be extracted from Okpocha or *ackee* including, alkaloids, triterpenoids, phenolic compounds, carotenoids, steroids and ketones (Mahabub *et al.*, 2009).

*Blighia unijugata* is used as a vegetable and also in the treatment of fever, nausea and vomiting, leprosy, eyes aches, coughing, headaches, rheumatism and stiffness, dizziness and high blood pressure. Ethanol extracts of roots stem barks and leaves have shown antimalarial activity especially against *Staphylococcus aureus* (Dehghan *et al.*, 2006).

Diabetes is a syndrome characterized by chronic hyperglycemia and associated with absolute or relative deficiency in insulin secretion or insulin action (Ahmad *et al.*, 2006). Herbal medicines have been used as an anti-diabetic therapy alone, along with insulin or other synthetic oral hypoglycemia agents (Gupta *et al.*, 2004). The use of synthetic agent is frequently associated with several undesirable side effects and fails to correct the fundamental biochemical lesion and diabetic complication (Ebong *et al.*, 2008). The search for a cure of diabetes continues along with traditional and alternative medicine. Many herbal supplements have been used for the treatment of diabetes, but the scientific evidence to support their effectiveness has only been investigated (Isaac *et al.*, 2011).

Diabetes is strongly associated with oxidative stress (Nwachukwu and Iweala, 2009). Chronic hyperglycemia resulting from diabetes brings about a rise in oxidative stress due to overproduction of reactive oxygen species (ROS) as a result of glucose autooxidation and protein glycosylation. Generation of ROS leads to oxidation damage of the structural components (such as lipid, DNA and proteins) of cells which culminate into complications affecting the eyes, kidney, nerves and blood vessels (Dermurari and Jivani, 2010). Oxidation results in cells is also created by the impairment in functioning of endogenous antioxidant enzymes because of non-enzymatic glycosylation and oxidation (Mahabub *et al.*, 2009).

## II. Aim And Objectives

The aim of this research was to investigate the hemoglobin level, total white blood cell count and packed cell volume in the albino rats treated with aqueous extract of fresh leave of *Blighia unijugata*.

## III. Methods

### Collection of Plant Material

Fresh leaves of *Blighia unijugata* were collected in large quantities from Edukwu in Abakaliki Local Government Area, of Ebonyi State. The fresh leaves were washed thoroughly with water weighed and homogenized with mortar and pestle and then kept for further processes.

### Extraction of Plant Material

The aqueous extraction of *Blighia unijugata* leaves was done by soaking method. 200g of the fresh leaves were washed, homogenized and soaked in a 200ml of distilled water for 24hours. The leaves were filtered and squeezed in a sieving cloth. The extract was poured into a clean evaporation rotor. The active compounds were obtained and redissolved with a distilled H<sub>2</sub>O and 250mls of the concentrate was obtained. The concentrate was stored in a bottle and wrapped with aluminum foil and kept in the fridge for preservation and for administration.

### Collection of Animals

Twenty five adult male and female albino rats weighing 80-200g were obtained from the Veterinary Medicine Department, University of Nigeria, Nsukka. The rats were kept in a clean and dry iron cages in animal house of Biochemistry Department in Ebonyi State University. The rats were divided into five groups A, B, C, D, and E. They were treated with *Blighia unijugata* extract solution according to their weights.

Group A → 100mg/kg  
Group B → 200mg/kg  
Group C → 300mg/kg  
Group D → 400mg/kg  
Group E → Control.

They were fed with livestock feed and water within these periods. The animals were acclimatized for 7days in the standard environmental control.

### Sample Collection

After the administration of the extract to the albino rats orally for one week (7days), the animals were starved for a period of 12hours and then sacrificed using dissecting kit. The veins leading to the eyes were punctured using a capillary tube and the blood was allowed to drain down into blood collection tubes and were corked with its cover and centrifuged at about 3000rev for 15minutes to obtain the sera and they were correctly labeled.

## DETERMINATION OF HEMATOLOGICAL PARAMETERS

Hematological parameters of packed cell volume, hemoglobin concentration and white blood cell counts would be determined using (Dacie and Lewis 1991) methods.

## IV. Results

### PHYSICAL OBSERVATION

Unlike the control group E, untreated group that showed no observable changes, there was a decrease in physical activities feed and water intake in the untreated animals then in group A, B, C and D after administration of extract on the first day but they later became active.

### CHANGES IN BODY WEIGHT

The result of the changes in the average body weight of the albino rats, during seven (7) days of Administration, the average body weights of the groups are shown in table 1. The result showed that mean values of test group reduced compared to that of the control group.

**Table: Mean (X) ± Standard Deviation (S.D) of Weight of albino rats.**

Day/group	A	B	C	D	E
1	89.75±1.56	90.50±1.11	96.50±1.16	102.75±0.83	100.50±1.48
2	88.50±1.31	88.25±1.17	94.75±2.03	100.25±1.48	101.75±1.16
3	86.50±1.28	86.76±1.09	92.50±2.69	98.50±1.74	104.25±2.19
4	84.75±1.64	85.25±1.02	90.25±1.48	96.25±1.23	106.50±1.12
5	83.25±1.48	83.75±1.31	86.75±2.12	93.50±1.12	108.50±1.43
6	81.25±1.78	82.25±1.27	84.75±1.57	91.50±1.06	110.50±1.56
7	79.50±1.12	80.75±1.61	83.25±1.09	89.25±1.48	112.25±1.19

**Table shows the mean (X) and standard (S.D) of the weights of albino rats during the seven (7) days of extracted (sample) administration.**

Group/treatment	HB(g/dl)	PVC(%)	WBCX10 <sup>9</sup> /L
Group A	13.43±4.80	43.88±3.34	13.91±3.16
Group B	15.14±3.87	52.29±3.68	15.17±2.87
Group C	17.26±3.23	61.34±2.21	17.39±3.13
Group D	19.28±1.53	78.63±3.58	19.97±3.13
Group E	11.25±3.89	39.21±3.94	12.07±5.19

### V. Discussion

The observed decrease in the physical activity of the treated animals when compared to the control is yet to be understood. Therefore, the reason for this increase observation is still under investigation to know the actual mechanism, though may be as a result of the extract administered. The result of this study is in accordance with the work carried out (Ekanem and Yusuf, 2007). These adverse effects may manifest significant alterations in the levels of bio-molecules such as enzymes and metabolic product, normal functioning and histomorphology of the organs (Gornal *et al.*, 1949).

The result of the effect of aqueous extract of fresh leaves of *Blighia unijugata* on haemoglobin level, PCV and total white blood cell of albino rats showed that there was significant increase in the level of HB, PCV and WBC of the treated groups A, B, C and D while there was decrease (P<0.05) in the control.

### VI. Conclusion

The findings of this study indicate that administration of the extract of fresh leaves of *Blighia unijugata* significantly increased hemoglobin level, PCV and total white blood cell count of the treated animals. These findings support the traditional use of *Blighia unijugata* for controlling of anemic related diseases

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