

Research Paper

The Effects of Ethanol Leaf-Extract of *Mucuna Pruriens* on Haemoglobin Level and Packed Cell Volume in Albino Rats

Offor, C.E.

Department of Biochemistry, Ebonyi State University, Abakaliki, Nigeria.

ABSTRACT:- The effects of ethanol leaf-extracts of *Mucuna pruriens* on haemoglobin level and packed cell volume were conducted using albino rats. The haemoglobin (Hb) levels were conducted spectrophotometrically while the packed cell volume (PCV) was studied by capillary tube method. The animals were grouped into four (A, B, C and D) containing six animals per group. Groups A, B, C and D were administered *Mucuna pruriens* leaf-extract at the doses of 200mg/kg, 400mg/kg, 600mg/kg and 0mg/kg body weights. The administration of the extracts was by oral intubation for the period of fourteen days. The haemoglobin concentrations (g/dl) of the animals in groups A, B, C and D recorded 13.64 ± 1.11 , 15.36 ± 1.60 , 16.82 ± 1.68 and 10.46 ± 0.80 respectively with corresponding %PCV as 38.24 ± 2.00 , 42.32 ± 2.14 , 44.12 ± 2.12 , and 32.68 ± 1.86 . The percentage increase in the body weights were 55.56, 57.89, 60.00 and 35.00 for the animals in groups A, B, C and D respectively. There were dose-dependent significant ($p < 0.05$) elevations in hemoglobin concentration, PCV and body weights of the animals at all the stipulated doses. The leaf-extract of *Mucuna pruriens* could boost the haematological indices in albino rats.

Keywords:- Leaf-extracts, haemoglobin, packed cell volume and albino rats.

I. INTRODUCTION

Over 80% of Nigerians in rural areas and about 40% in the urban areas depend partly or wholly on traditional medicine. The use of non-wood forest products in Nigerian traditional medicine and traditional religion are inseparable as both rely on soil minerals, flora and resources (Oliver, 1999). All plant forms and parts are used for traditional medicines; these include leaves, flowers, fruits, seeds, nuts and roots (Odebiyi *et al.*, 1999).

Medicinal plants are plants in which one or more of their parts contain substances that can be used for therapeutic purposes or which are precursors for synthesis of useful drugs (WHO, 1991). Therefore, medicinal plants are plants that contain medicinal products as their active ingredients. They are used commercially in modern medicine and pharmacology (Andrews and Fatt, 2002). Traditional medicine refers to the following components: acupuncture, traditional birth attendants, mental healers and herbal medicine (Godkar, 1994). Medicinal plants are the oldest known health-care products. Their importance is still growing although it varies depending on the ethnological, medical and historical background of each country (Tan *et al.*, 2000).

Mucuna pruriens is a tropical legume known as velvet bean. It is found in Africa, India and the Caribbean. The plant is infamous for its extreme itchiness produced on contact, particularly with the young foliage and the seed pods. It has value in agricultural and horticultural use (Dalziel, 1991). It is an annual, climbing shrub with long lines that reach over 15m in length. When the plant is young, it is almost completely covered with fuzzy hairs, but when older, it is almost completely free of hairs. The leaves are ovate, reverse ovate or rhombus shaped. The sides of the leaves are often heavily grooved and the tips are pointy. In young *Mucuna pruriens* plants, both sides of the leaves have hairs. In many parts of the world, *Mucuna pruriens* is used as an important forage, fallow and green manure crop (Oliver, 1990). It has also been found to have antidepressant properties in cases of depressive neurosis when consumed (Dalziel, 1991). The formulations of its seed powder have shown promise in the treatment of Parkinson's disease (Maxson and Dhawan, 1982).

Hemoglobin (Hb) is the iron-containing oxygen transport metalloprotein in the red blood cells of all vertebrates (Dyckner and Elackm, 1996). Hemoglobin in the blood carries oxygen from the respiratory organs to the rest of the body where it releases the oxygen to burn nutrients to provide energy to power the functions of the organism and collect the resultant carbon dioxide to bring it back to the respiratory organs (Amin *et al.*, 1996). Packed cell volume (PCV) is the percentage of the concentration of red blood cells in blood. It is normally about 45% for men and 40% for women (Monica, 2000).

This research work was aimed at investigating the effects of ethanol leaf-extract of *Mucuna pruriens* on the hemoglobin level and packed cell volume in albino rats.

II. MATERIALS AND METHODS

Materials

Twenty-four albino rats were obtained from University of Nigeria Nsukka (UNN). Fresh leaves of *Mucuna pruriens* were obtained from Obosi Local Government area of Anambra State, Nigeria.

Methods

Extraction of plant material

500g of dry and ground *Mucuna pruriens* leaves was soaked in 1000mls of ethanol in a container such that the ethanol would cover the sample. It was left standing for about 24 hours. The solution was squeezed and filtered with a muslin cloth, and the filtrate was poured into an evaporation dish. It was then exposed to air and mild heat of the sun until a semi-solid extract was gotten.

Administration of plant extract to animals

The albino rats in groups A, B, C and D (containing six rats in each group) were administered with the extract by oral intubation at the doses of 200mg/kg, 400mg/kg, 600mg/kg and 0mg/kg (Control) of body weight respectively twice daily for fourteen days.

Collection of blood sample for analysis

The blood samples were collected through the eye vein by the use of capillary tubes.

Determination of haemoglobin and packed cell volume (PCV)

The haemoglobin levels were determined spectrophotometrically by method of Khan *et al.* (2006). The method of Wintrobe (1998) was adopted to determine the packed cell volume of the blood samples with a hematocrit tube.

Data Analysis

All the tested parameters were subjected to statistical analysis using T-test. Differences between means were regarded significant at $P < 0.05$ (Oyeka, 1996).

Determination of the body weights of the animals:

The body weights of the animals were determined every day by the use of a weighing balance.

III. RESULTS

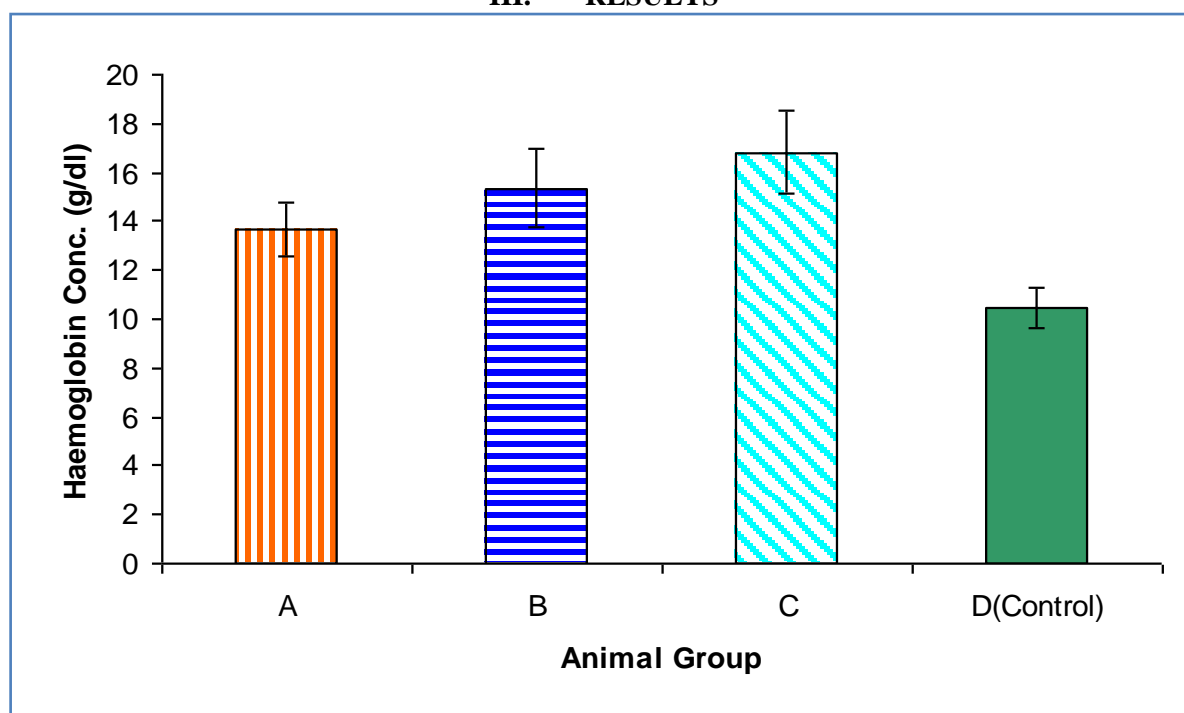


Fig. 1: The haemoglobin concentrations (g/dl) of the animals

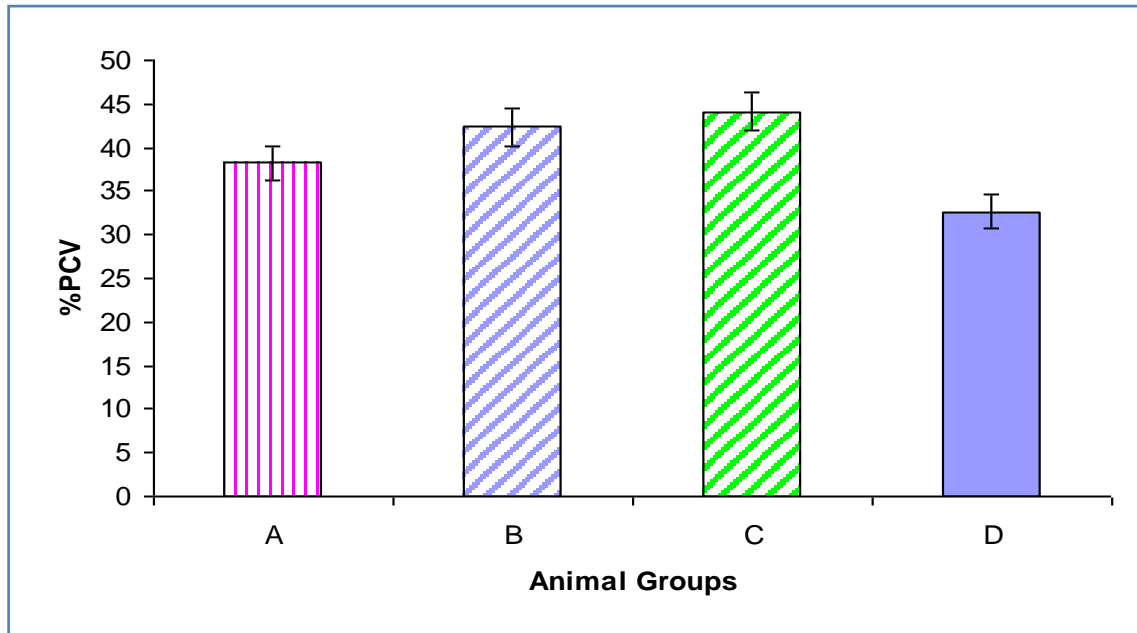


Fig. 2: The %PCV of the animals.

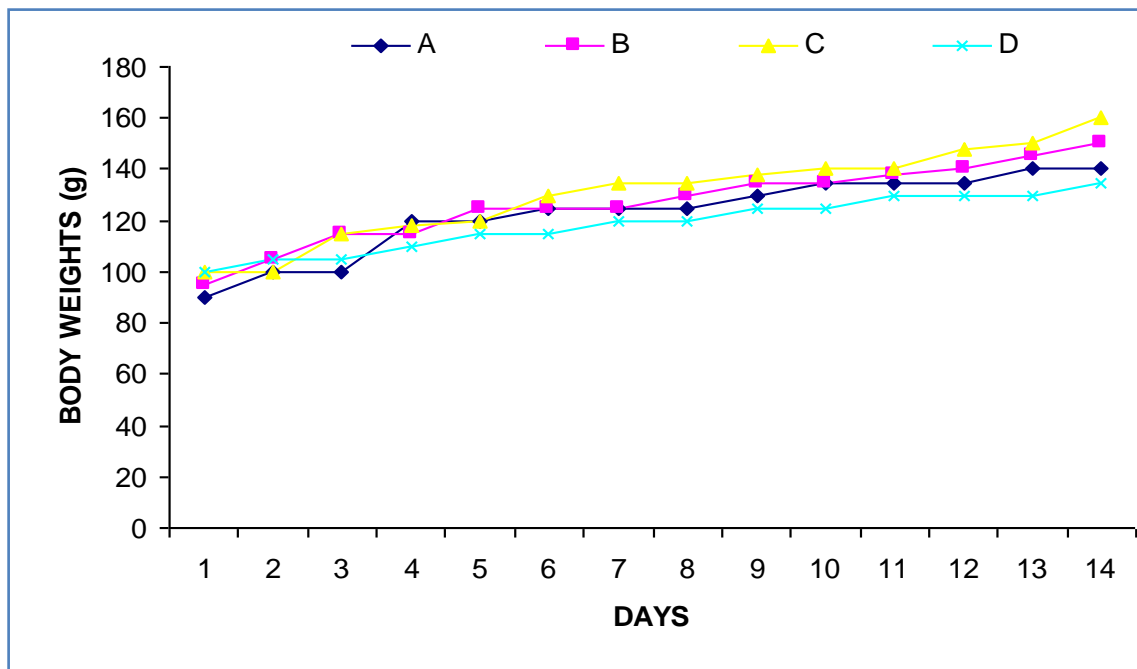


Fig. 3: Body weights of the animals within fourteen days of administration of the extract

IV. DISCUSSION AND CONCLUSION

There was increase in the food and water intake of the animals. There were significant ($p < 0.05$) dose-dependent elevations in haemoglobin levels and PCV of the animals (Fig. 1 and 2). Aqueous extract of *Cucurbita pepo* increased the level of haemoglobin in animals treated with aqueous extract of *Cucurbita pepo* (Grantham and Anic 2001) Aqueous leaf-extract of *Vernonia amygdalina* produced no significant changes in PCV levels (Amole *et al.*, 2006). A decrease in PCV and Hb levels below normal values translates to anemia and reduced oxygen carrying capacity. The findings are of nutritional, clinical and veterinary relevance considering the diverse applications of the plant in almost all African populations (Ojiako and Nwanjo, 2006).

There was a significant ($p < 0.05$) increase in the body weights of the animals (Figure 3). Odebiyi *et al.* (1999) reported also that ethanol extract of *Mucuna pruriens* showed a significant increase in the weights of the animals. The aqueous extract of *Cucurbita pepo* showed increase in the body weights of the animals (Barnes *et al.*, 2002). The increase in the body weights could be because of blood-boosting capacity of the plants.

In conclusion, the ethanol leaf-extract of *Mucuna pruriens* significantly ($p < 0.05$) increased haemoglobin levels and PCV dose-dependently.

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