Effects of Ethanol Leaf-Extract of *Pterocarpus santalinoides* on Haematological Parameters in Rats

C.E. Offor and S.O. Ogbugo

Department of Biochemistry, Ebonyi State University, Abakaliki, Nigeria

**Abstract:** Effects of ethanol leaf-extract of *Pterocarpus santalinoides* on haematological parameters were investigated in rats using spectrophotometric and centrifugation methods. Sixteen Wister albino rats were grouped into four (A, B, C and D). Groups A, B, C and D were administered the extract through oral intubation at the doses (mg/kg body weights) of 0, 200, 400 and 600 respectively for two weeks. The blood samples were collected on the fifteen day following the last day of administration. The Haemoglobin (Hb) levels (g/dl) recorded 12.30±0.69, 14.17±1.25, 15.63±1.19 and 15.07±0.93 for the animals in groups A, B, C and D respectively with corresponding levels (%) of packed cell volume (PCV) as 35.67±2.08, 43.00±1.61, 43.3±1.53 and 45.00±1.65. Platelet (PLT) levels (x10^9/l) recorded 211.60±5.09, 347.67±3.91, 364.6±5.15 and 435±5.86 for groups A, B, C and D respectively. Hence, the results showed significant (p<0.05) increase in the levels of haemoglobin, packed cell volume and platelets.

**Key words:** *Pterocarpus santalinoides* leaves and haematological parameters

**INTRODUCTION**

Blood acts as a pathological reflector of the status of exposed animals to toxicants and other conditions [1-3]. Examining blood for their constituents can provide an important information for the diagnosis and prognosis of diseases in animals [4]. Blood constituents change in relation to the physiological conditions of health. These changes are of value in assessing response of animals to various physiological situations [5]. Changes in haematological parameters are often used to determine various status of the body and to determine stresses due to environmental, nutritional and/or pathological factors [6].

Haematological parameters such as haematocrit, haemoglobin, erythrocytes and white blood cells can be used as indicators of toxicity and have a broad potential application in environmental and occupational monitoring [7,8]. They are those parameters that are related to the blood and blood forming organs [9].

Plants are primary sources of medicines, food, shelters and other items used by humans every day. Their roots, stems, leaves, flowers, fruits and seeds provide food for humans [10,11]. They not only provided food and shelter but also serve the humanity to cure different dysfunctions. It is now believed that nature has given the cure of every disease in one way or another [12]. Plants have been known to relieve various diseases in Nigeria. One of such plant species used for the management and treatment of ailment is *Pterocarpus santalinoides* [13,14].

*Pterocarpus santalinoidis*, commonly called red sandal wood in English, “uturukpa” in Igbo. It is classified under the kingdom Plantae, Order (fabales), family (faboideae), Genus (*Pterocarpus*) and Species (*santalinoidis*) [15] and [16]. Various morphological parts of *Pterocarpus santalinoides* are used in traditional medicine, in many African countries, to treat an array of human ailments. The ethno-medical use of leaves of *Pterocarpus santalinoides* in the treatment of diarrhoea and other gastrointestinal disorders has been scientifically proven with its triglyceride and glucose lowering properties [17] and [18].

This work was aimed to study the effects of ethanol leaf-extract of *Pterocarpus santalinoides* on haematological parameters of albino rats.

**MATERIALS AND METHODS**

**Materials:** Fresh leaves of fully grown *Pterocarpus santalinoides* were collected from Mgbabor village in Abakaliki local government area of Ebonyi State. Sixteen albino rats were purchased from animal house of the
Faculty of Veterinary Medicine, University of Nigeria, Nsukka. All chemicals and reagents were of analytical grade.

**Methods**

**Extraction of Plant Materials:** *Pterocarpus santalinoides* leaves were collected and dried under room temperature before being ground into powder. The dried sample was ground with an electric blender to powdery form. 500g of the ground sample was soaked with 1200ml of ethanol and left for 48h. Muslin cloth was used to filter the solution and the filtrate was then allowed to evaporate under room temperature to obtain the sticky extract of *Pterocarpus santalinoides*.

**Administration of Plant Extract:** Sixteen albino rats were used for this study. They were distributed randomly into four groups (A, B, C and D). Groups A, B, C and D were administered the extract by oral intubation at the doses of 0mg/kg, 200mg/kg, 400mg/kg and 600mg/kg body weight respectively for two weeks.

**Determination of Haematological Parameters:** The haemoglobin concentration, PCV level and platelet count were done by the methods of Cheesbrough [20].

**Statistical Analysis:** All the tested parameters were subjected to statistical analysis using T-test. Differences between means were regarded significant at p<0.05.

**RESULTS AND DISCUSSION AND CONCLUSION**

The levels of haemoglobin in the animals administered the ethanol leaf-extract of *Pterocarpus santalinoides* increased significantly (p<0.05) and dose-dependently (Fig. 2). Similar result was reported by
Okagbare et al. [21] in which ethanol leaf-extract of Pterocarpus santalinoides recorded a progressive increase in the haemoglobin. Ajayi et al. [22] reported that the inclusion of Pterocarpus santalinoides powder has an effect on iron absorption. Aqueous extract of Cucurbita pepo increased the level of haemoglobin in animals treated with aqueous extract of Cucurbita pepo Aqueous leaf-extract of Vernonia amygdalina produced no significant changes in PCV levels [7]. A decrease in PCV and Hb levels below normal values translates to anaemia 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 [18].

The extract of Pterocarpus santalinoides also significantly (p<0.05) increased the percentage levels of packed cell volume (PCV) of the albino rats (Fig. 3). The ethanol leaf- extract showed markedly a significant increase (p<0.05) in the platelet index in the administered groups (Fig. 4). Report from Okagbare et al. [21] indicates that the ethanol leaf-extract of Pterocarpus santalinoides has significant effect on the packed cell volume.

In conclusion, the ethanol leaf-extract of Pterocarpus santalinoides exerted significant (p<0.05) and dose-dependent increase in the concentrations of haematological indices such as haemoglobin, packed cell volume and platelets.

REFERENCES