



## The Effect of the Ethanolic Extract of the Leaf of *Chromolaena Odorata* on the Packed Cell Volume (PCV) of Wistar Albino Rats

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### Abstract

The study investigated the hematinic effect of the ethanolic extract of *Chromolaena odorata* leaf on groups of male wistar albino rats. The rats were divided into 3 groups of 5 rats each .Group A and B which were the treated groups received 10mg/kg and 20mg/kg body weight of the extract .Group C (control) was given 5% solution of tween 80 only. The administration of the extract was done orally for a total period of 21 days .Blood samples were collected at the end of the study and the results of the blood samples analysis showed that group A and B had mean PCV levels of  $29\pm 0.01\%$  and  $31\pm 0.09\%$  respectively while that of group C (control) was  $32\pm 0.17\%$  .The was no significant difference ( $P>0.05$ ) between the treated and non-treated groups . The results of the study showed that the ethanolic extract of *Chromolaena odorata* leaf had no adverse effect on the packed cell volume (PCV) of the experimental rats.

Key words:*Chromolaena odorata*, PCV ,blood samples, ethanolic extract , wistar albino rats

### Introduction

A systemic research for useful bioactive compounds from medicinal plants is now considered to be a rational approach in drug research .Medicinal plants can make important contribution to the World Health Organization (WHO) goal to ensure that all people world wide lead a sustainable socio-economic productive lines. *Chromolaena odorata* is a fast growing perennial and invasive weed growing mainly in the south and central America and distributed throughout Africa and tropical Asia<sup>[1]</sup>. *Chromolaena odorata* can be poisonous to lives as it has exceptional high levels of nitrates (5-6 times above the toxic level ) in the dead and young shoots ,the cattle feeding on this dies of tissue anoxia<sup>[2]</sup>.

Despite this negative effects, *Chromolaena odorata* is still been used by medical practitioners of traditional medicine because of its anti-spasmodic, anti-protozoa, anti-trypanosomes, anti-bacterial, anti-hypertensive, anti-inflammatory, astringent, diuretic and hepatotropic effects<sup>[3]</sup>. The leaves could be ground and the extracted juice taken to alleviate fever or the treatment of diabetes<sup>[4]</sup>. The medical values of *Chromolaena odorata* are due to some specific phenolic compounds that have been isolated from it<sup>[5]</sup>. In Southern part of Nigerian, the leaves are used for wound dressing, skin infection and to stop bleeding.



The extract of *Chromolaena odorata* at 50-200mg/kg inhibits paw oedema in rats. It also has anti-motility and anti-diarrhoeal effects<sup>[6]</sup>. The ethanolic extract of *Chromolaena odorata* has LD50 of 16.50/kg body weight<sup>[7]</sup>.

Although *Chromolaena odorata* is used for a wide range of medical problems, its toxicants such as high levels of nitrate may harm the cells especially the red blood cells. Also most herbal medicinal preparations are known to cause anaemia.

This study aimed at investigating the effects of ethanolic extract of *Chromolaena odorata* on the blood levels (PCV) of albino rats.

## Materials and Methods

### Collection of Sample

The *Chromolaena odorata* levels were collected within the locality of Science Village, Nnamdi Azikiwe University, Awka, Nigeria and was identified by a taxonomist in the department of Botany, Nnamdi Azikiwe University, Awka, Nigeria.

### Procurement of Rats:

Fifteen male albino rats used for the study were bought from the department of Veterinary Medicine, University of Nigeria Nsukka, Enugu Campus, Nigeria.

**Reagents:** All reagents used were of analytical grade.

## SAMPLE EXTRACTION

The leaves of *Chromolaena odorata* were dried under room temperature and ground to fine powder using hand grinder. 50g of the ground sample was weighed using electrical weighing balance and dissolved in 300ml of 70% ethanol. This was properly mixed and allowed to stand for 48 hours. It filtered using Whatmann no.1 filter paper. The filtrate was concentrated by heating in a water bath at 40<sup>0</sup>c and the remaining solvent was removed in a rotary evaporation. The extract was collected and weighed and then used for the study.

### Sample Preparation:

Five percent tween 80 in distilled water was prepared. Two grams of the extract was properly dissolved in 85mls of 5 % tween 80.

### Treatment of Animals:

Fifteen male wistar albino rats 8 weeks old weighing 100-125g were randomly divided into 3 groups of five rats each. They were acclimatized for one week. Groups A and B received 10 and 20mg/kg body weight of the extract respectively while group C (control) received only 0.2ml of 5% tween 80. The extract was administered orally for 21 days using cannular. The animals received water and food ad libitum and had 12 hours light /12 hours darkness. They were handled in line with the guidelines laid down by the ethical committee on animal handling.

### Sacrifice and sample collection:

The animals were starved overnight prior to sacrifice. They were sedated with cotton soaked in chloroform and then blood samples were collected by heart puncture from each of the rats. The blood



samples were dispensed into EDTA containing sample tubes. The sample were analyzed for packed cell volume (PCV) using a hematological auto-analyzer (Sysmex kx-21, Japan)

### Methods:

Packed Cell Volume (PCV) Analysis :Packed cell volume (PCV)analysis was done using automatic analyser sysmex kx-21, Japan.

### Statistical Analysis:

Mean values of the treated and control groups were compared using Analysis Of Variance (ANOVA) as described by<sup>[8]</sup>. Results were significant at  $p < 0.05$ .

### Result:

The results of the packed cell volume for the 3 groups are expressed as mean± standard deviation (SD) in table 1.

**Table 1: PCV Results**

Group	PCV (%)
A(10mg/kg b.w)	29±0.10
B(20mg/kg b.w)	31±0.10
C(Control)	32±0.17

### Discussion:

The results obtain from the study showed that groups A, B and C had 29±0.10%,31±0.09% and 32±0.17% respectively. There was no statistically significant difference ( $P > 0.05$ ) between the treated groups and the control.

*Chromolaena odorata* can be poisonous to lives as it has exceptional high levels of nitrates (5-6times above the toxic level)<sup>[2]</sup>. The leaves of *Chromolaena odorata* contain nitrate<sup>[9]</sup>.

High level of nitrates should be expected to lead to haemolysis and subsequent anemia. Elevated nitrate level in drinking water has been implicated in methaemoglobinaemia<sup>[10]</sup>, <sup>[11]</sup> on the other hand observed that *Chromolaena odorata* has stabilizing activity on the membrane red blood cell (RBC).

The results of the study agree with the work of<sup>[11]</sup> given the fact that the treated groups did not show significant reduction in their PCV compared to the control.

### Conclusion:

The result obtained from this study shows that ethanolic extract of *Chromolaena odorata* is safe for consumers in terms of its effect on blood volume. So consumers of the herbal preparation made from ethanolic extract of *Chromolaena odorata* should not worry about anaemia.

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