THE EFFECT OF MUCUNA PRURIEN AQUEOUS LEAF EXTRACT ON HAEMATOLOGICAL PARAMETERS OF WISTAR RAT
THE EFFECT OF *MUCUNA PRURIEN* AQUEOUS LEAF EXTRACT ON HAEMATOLOGICAL PARAMETERS OF WISTAR RAT

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ABSTRACT

Background: Mucuna prurien is a tropical legume also known as velvet bean and has been used by ancient healers’ community for different healing purposes.

Objective: This study was carried out to determine the effect of Mucuna Prurien leaves aqueous crude extract on haematological parameters of Wistar rats.

Materials and Methods: Twelve healthy adult wistar rats weighed 1200g ± 1700g body weight respectively for (21) days produced periodic body weight gained while assessment of haematological parameters was done using sysmex KX-21N. Outcome values from the assessment were collated as data and statistically analyzed.

Results and Discussions: The results showed that the leave extract produced relatively decreased total white blood cell count (TWBC) though falls within the control normal range. There was significance increase in red blood cell (RBC), packed cell volume (PCV), white blood cell (WBC) and Haemoglobin (HB) concentrations within normal limit which can indicates the possibility of using this leaf in treating anaemia.

Conclusion and Recommendations: This study revealed that administration of mucuna prurien for forty eight (48) hours could stimulate erythropoiesis without haema-toxic effect in rat, however, mucuna prurien causes an increase in RBC, platelet, lymphocyte, MCH, MCHC, and MCV; that was significant enough for clinical trial in cases of anemia. Further study is therefore recommended on Mucuna Prurien especially in finding out the lethal dose and the identification of the plant component responsible for the observed leucopenia so that it can be safer for use in the treatment of anaemia and in order to also avoid uncontrollable increase of red cell parameters (erythrocytosis) and leucopenia.

Keywords: Mucuna prurien, Haematological parameters, Anaemia, Erythropoiesis
INTRODUCTION

*Mucuna Prurien* or velvet bean is a bean that grows from trees and is vary itchy to touch or to the body due to serotonin content, *Mucuna Prurien* (MP) is a twining itching plant [1]. Mucuna prurien is an annual climbing legume that grows 3-18 m in height, indigenous to the regions, especially Africa, India and West India. It is widely spread over most of the subcontinent and is found in bushes, hedges and dry decidus, low forest through the plains of India. M. prurien belongs to the family of fabacaeae. Clinical study confirmed the efficacy of the seed of *M. prurine* in the management of Parkinson disease by virtue of their L-DOPA content. Velvet leaf (mucun prurien) are found in Asia including Malaysia, America, and Africa the leaf have been prescribed by traditional practitioner in Nigeria as an oral prophylactic for feeding animal like wistar rat [2].

This property is attributed to the presence of s-hydroxytryptamine (SHT) in the hair on the pods [3]. MP seed are herbaceous forage and this food legumes have for a long time found wide spread usage as rotation crop for management of various pests and weeds control [4, 5]. It is little known and used for human food and animal feed in Nigeria [6]. *Mucuna prurien* (MP) has been pharmacologically studied for various activities like aphrodisiac anti-diabetic, anti-microbial and anti-epileptic activities. It was showed that the Nigeria *mucuna prurien* leaf improve the haematological parameter determined in a dose dependent manner [7].

*Mucuna prurien* is a tropical legume also known as velvet bean has been used by ancient healers community. Herbal medicine has relied on *mucuna prurien* since 1500Bc to support ailment such as snake bites, intestinal disorder, sexual response, and melancholy mood. Let’s take a look at the recent studies that have evaluated how this uncommon plant can support brain health and stress management [8, 9]. Haematological parameter in Wistar rat investigation is regularly used in rat health management. In this blood cellular level of animal under study is compare with normal value of health animals previously determined and reported. Deviation from this normal value may be indication of possible disease condition [10][17]. The purpose of determining the haematological indices in Wister rats is to corroborate and correlate the fundamental result obtained in the routine complete blood count (CBC), Packed Cell Volume (PCV), red blood cell (RBC) count, and haemoglobin estimation so as to determine the effect of *mucuna prurien* leaf on level of blood of the Wister rats.

MATERIALS AND METHODS

STUDY DESIGN

Rats were group into four, T1 as control; T2 GROUP, T3 GROUP, T4 GROUP were the test groups. (T1R1,T1R2,T1R3); (T2R1,T2R2,T2R3); (T3R1,T3R2,T3R3); (T4R1,T4R2, TR3).

T=TEST

R=REPLICATE

Mucuna pruien aqueous leaves extract was administered to all the group for 21 days with 3 replicates in each of the groups, after which the blood samples were collected and analyzed.
STUDY LOCATION
This study was carried out at NKST Len Gabriels School of Medical Laboratory Science Mkar, Gboko Local Government Area of Benue state and 161 Nigeria Air Force Hospital Laboratory Makurdi.

PREPARATION OF PLANT EXTRACT
The leaves were washed, shade dried and grinded into coaxed form and soak with distilled water for 48 hours. Mixture was then filtered; the filtrate was evaporated to dryness at 40°C in a water bath. The dried extract was kept in a clean, cool and dried container, and was used throughout the experiment. The extract was reconstituted in distilled water for a known weight of the dried filtrate to obtain the desired concentration [11].

EXPERIMENTAL DESIGN
This study of the effect of the aqueous extract of *Mucuna pruriens* leaves was carried out by the method of (Lorke]. In the initial phase, the Wistar albino rats were divided into four groups, T1 as control, T2 GROUP, T3 GROUP, T4 GROUP of three animals each. The groups were administered orally, doses of 10, 100 and 1000mg/kg body weight of the aqueous extract of the leaves respectively.

ADMINISTRATION
20ml of distilled water was given to the control as T1 and 20 ml of mucunal prurient juice was given to the Wister rat groups as T2, 0. 4mg, T3, 1mg, and T4. 10mg everyday according to their groups’ and grams label.

COLLECTION OF THE BLOOD SAMPLES
Rats were sacrificed using chloroform anesthesia. Blood sample were collected from the neck into a plain sample tubes with the aid of a 5ml syringes for the haematological parameters testing.

FULL BLOOD COUNT ANALYSIS/ PROCEDURES
The blood samples were collected from neck puncture of the rats; the blood was mixed gently homogenously; then the full blood count test was carried out with Automatic haematology analyser [12].

PRELIMINARY PHYTOCHEMICAL SCREENING
Preliminary phytochemical screening of the aqueous extract of Mucuna Pruriens leaves was performed using the method described by Tiwaris et al. [13].
RESULTS

DATA PRESENTATION AND RESULT FINDINGS

TABLE 1: Phytochemical analysis of Mucuna pruriens leaves by method of Muhammad et al. [11].

| Phytochemical | Mucuna pruriens leaves |
|---------------|------------------------|
| Alkaloid       | -                      |
| Saponins      | +                      |
| Flavonoids    | +                      |
| Cardiac glycosides | +                  |
| Carbohydrates | +                      |
| Tannins       | +                      |

- = absence, + = present

Table 1 above shows that Mucuna pruriens leave contain saponins, flavonoids, Cardiac glycosides, carbohydrates and Tannins.

TABLE 2: WEIGHTS OF WISTAR RATS

|             | 1 – 7 days | 7 – 14 days | 14 – 21 days |
|-------------|------------|-------------|--------------|
| Control     |            |             |              |
| T1R1        | 1400g      | 1300g       | 1400g        |
| T1R2        | 1300g      | 1200g       | 1300g        |
| T1R3        | 1300g      | 1300g       | 1300g        |
| SAMPLE      |            |             |              |
| T2R1        | .          | 1400g       | 1500g        |
| T2R2        | 1300g      | 1500g       | 1400g        |
| T2R3        | 1400g      | 1400g       | 1400g        |
| T3R1        | 1400g      | 1600g       | 1600g        |
| T3R2        | 1300g      | 1500g       | 1500g        |
| T3R3        | 1500g      | 1600g       | 1600g        |
| T4R1        | 1400g      | 1700g       | 1700g        |
| T4R2        | 1400g      | 1600g       | 1800g        |
| T4R3        | 1300g      | 1700g       | 1700g        |
Graph 1: Graph showing the Change in weight of the Wistar Rats Administered with Mucuna pruriens Leaves Extracts at different time points.

The graph above shows a statistically significant increase in the weight of Wister rats

**TABLE 2.1: ANOVA SUMMARY TABLE**

| ANOVA: Two-Factor With Replication |          |          |          |          |          |
|-----------------------------------|----------|----------|----------|----------|----------|
| SUMMARY                           | Control  |          |          |          |          |
| Count                             | 4        | 4        | 4        | 12       |          |
| Sum                               | 5300     | 5200     | 5500     | 16000    |          |
| Average                           | 1325     | 1300     | 1375     | 1333.3333|          |
| Variance                          | 2500     | 6666.666667 | 9166.666667 | 6060.606067|
| Count                             | 4        | 4        | 4        | 12       |          |
| Sum                               | 5400     | 6000     | 5900     | 17300    |          |
| Average                           | 1350     | 1500     | 1475     | 1441.666667|          |
| Variance                          | 3333.3333| 6666.666667 | 9166.666667 | 9924.24242|
| Count                             | 4        | 4        | 4        | 12       |          |
| Sum                               | 5600     | 6800     | 6800     | 19000    |          |
| Average                           | 1400     | 1650     | 1700     | 1583.3333|          |
| Variance                          | 6666.666667 | 3333.3333 | 6666.666667 | 23333.3333|
| Total                             |          |          |          |          |          |
| Count                             | 12       | 12       | 12       | 36       |          |
| Sum                               | 16300    | 17800    | 18200    |          |          |
| Average                           | 1358.3333 | 1483.3333 | 1516.666667|          |
| Variance                          | 4469.69697 | 26969.697 | 26969.697 |          |
TABLE 2.2: ANOVA: Weight of Wister Rats

| Source of Variate | SS  | df  | MS  | F               | P-value | F crit |
|-------------------|-----|-----|-----|-----------------|---------|--------|
| Sample            | 377222.222 | 2   | 188611.111 | 31.3384615 | 9.17E-08 | 3.35413083 |
| Columns           | 167222.222 | 2   | 83611.11111 | 13.8923077 | 7.104E-05 | 3.35413083 |
| Interaction       | 102777.778 | 4   | 25694.44444 | 4.26923077 | 0.0083382 | 2.72776531 |
| Total             | 809722.222 | 35  | 809722.222 |                 |         |        |

Table 2, Table 2.1, Table 2.2 and Graph 1 above shows statistically significant increase in the weight of Wister rats as a result of *Mucuna Prurien* aqueous leaf extract.

TABLE 3: Haematological Parameters of Wistar Rats that were fed with *Mucuna prurien* Aqueous Leaf Extract

| Haematology sample | WBC (x10³/ul) | RBC (x10⁶/n) | HGB (g/dl) | HCT (%) | MCV (fl) | MCH (pg) | MCHC (g/dl) | PLTX10³ | Lymp h (%) | Mon o | eosin | Neutr |
|--------------------|---------------|--------------|------------|---------|---------|---------|-------------|--------|------------|-------|-------|-------|
| Control            |               |              |            |         |         |         |             |        |            |       |       |       |
| T1R1               | 4.6           | 3.5          | 8.0        | 26      | 74.2    | 22.8    | 30.7        | 122    | 64         | 3     | 1     | 32    |
| T1R2               | 4.8           | 3.5          | 8.3        | 26      | 74.2    | 23.7    | 31.9        | 367    | 70         | 2     | 0     | 28    |
| T1R3               | 3.9           | 5.6          | 9.0        | 30      | 53.5    | 16.0    | 30          | 172    | 60         | 4     | 1     | 35    |
| TESTS              |               |              |            |         |         |         |             |        |            |       |       |       |
| T2R1               | 6.3           | 4.9          | 10.3       | 37      | 75.5    | 21.0    | 27.8        | 192    | 74         | 1     | 0     | 25    |
| T2R2               | 8.1           | 3.2          | 9.6        | 33      | 103     | 30      | 29.0        | 189    | 72         | 2     | 1     | 25    |
| T2R3               | 3.7           | 3.5          | 9.6        | 39      | 111     | 27.1    | 24.6        | 124    | 64         | 4     | 0     | 32    |
| T3R1               | 4.2           | 3.8          | 10.6       | 40      | 105     | 27.8    | 26.5        | 171    | 65         | 1     | 0     | 38    |
| T3R2               | 8.1           | 5.1          | 10.6       | 40      | 78.8    | 20.7    | 26.5        | 189    | 74         | 4     | 0     | 22    |
| T3R3               | 7.6           | 4.1          | 9.8        | 39      | 95.1    | 23.9    | 25.1        | 179    | 68         | 2     | 1     | 29    |
| T4R1               | 7.1           | 5.9          | 12.6       | 39.6    | 67.1    | 21.3    | 31.8        | 445    | 70         | 2     | 1     | 27    |
| T4R2               | 6.5           | 6.5          | 11.5       | 40.4    | 62.1    | 17.6    | 28.4        | 367    | 72         | 3     | 1     | 24    |
| T4R3               | 4.2           | 6.8          | 12.3       | 40.2    | 59.1    | 18.0    | 30.5        | 371    | 60         | 2     | 1     | 37    |

Table 3 above shows the result summary of the haematological parameters of the wistar rats fed with *Mucuna prurien*.
TABLE 3.1: Descriptive Statistics of the WBC results of Wistar Rats that were fed with *Mucuna pruriens* Aqueous Leaf Extract

|          | Mean   | Std. Deviation | N  |
|----------|--------|----------------|----|
| WBCCTRL | 4.4333 | .47258         | 3  |
| WBCTST1 | 6.0333 | 2.21209        | 3  |
| WBCTST2 | 6.6333 | 2.12211        | 3  |
| WBCTST3 | 5.9333 | 1.53080        | 3  |

TABLE 3.1.1: Correlations of WBCs Results

|          | WBCCTRL | WBCTST1 | WBCTST2 | WBCTST3 |
|----------|---------|---------|---------|---------|
| WBCCTRL | Pearson Correlation | 1       | .979    | -.191   | .917    |
|          | Sig. (2-tailed)      | .131    | .878    | .261    |         |
|          | Sum of Squares and Cross-products | .447    | 2.047   | -.383   | 1.327   |
|          | Covariance           | .223    | 1.023   | -.192   | .663    |
|          | N                    | 3       | 3       | 3       | 3       |
| WBCTST1 | Pearson Correlation  | .979    | 1       | .013    | .816    |
|          | Sig. (2-tailed)      | .131    | .991    | .392    |         |
|          | Sum of Squares and Cross-products | 2.047   | 9.787   | .127    | 5.527   |
|          | Covariance           | 1.023   | 4.893   | .063    | 2.763   |
|          | N                    | 3       | 3       | 3       | 3       |
| WBCTST2 | Pearson Correlation  | -.191   | .013    | 1       | -.567   |
|          | Sig. (2-tailed)      | .878    | .991    | .616    |         |
|          | Sum of Squares and Cross-products | -.383   | .127    | 9.007   | -3.683  |
|          | Covariance           | -.192   | .063    | 4.503   | -1.842  |
|          | N                    | 3       | 3       | 3       | 3       |
| WBCTST3 | Pearson Correlation  | .917    | .816    | -.567   | 1       |
|          | Sig. (2-tailed)      | .261    | .392    | .616    |         |
|          | Sum of Squares and Cross-products | 1.327   | 5.527   | -3.683  | 4.687   |
|          | Covariance           | .663    | 2.763   | -1.842  | 2.343   |
|          | N                    | 3       | 3       | 3       | 3       |
Table 3.1 and Table 3.1.1 above shows a dose dependent increase in the white blood cells (WBC).

**TABLE 3.2: Descriptive Statistics of the RBC results of Wistar Rats that were fed with *Mucuna prurien* Aqueous Leaf Extract**

|        | Mean   | Std. Deviation | N |
|--------|--------|----------------|---|
| RBCCTRL| 4.2000 | 1.21244        | 3 |
| RBCTST1| 3.8667 | .90738         | 3 |
| RBCTST2| 4.3333 | .68069         | 3 |
| RBCTST3| 6.4000 | .45826         | 3 |

**TABLE 3.2.1: Correlations of RBCs Results**

|        | RBCCTRL | RBCTST1 | RBCTST2 | RBCTST3 |
|--------|---------|---------|---------|---------|
| RBCCTRL| Pearson Correlation | 1       | -.350   | -.297   | .756    |
|        | Sig. (2-tailed)    | .772    | .808    | .454    |
|        | N               | 3       | 3       | 3       | 3       |
| RBCTST1| Pearson Correlation | -.350   | 1       | -.791   | -.878   |
|        | Sig. (2-tailed)    | .772    | .419    | .318    |
|        | N               | 3       | 3       | 3       | 3       |
| RBCTST2| Pearson Correlation | -.297   | -.791   | 1       | .401    |
|        | Sig. (2-tailed)    | .808    | .419    | .738    |
|        | N               | 3       | 3       | 3       | 3       |
| RBCTST3| Pearson Correlation | .756    | -.878   | .401    | 1       |
|        | Sig. (2-tailed)    | .454    | .318    | .738    |
|        | N               | 3       | 3       | 3       | 3       |

Table 3.2 and Table 3.2.1 above shows a relative increase in the red blood cell counts (RBC).
### TABLE 3.3: Descriptive Statistics of the Haemoglobin (HGB) results of Wistar Rats that were fed with Mucuna prurien Aqueous Leaf Extract

|          | Mean   | Std. Deviation | N  |
|----------|--------|----------------|----|
| HGBCTRL  | 8.4333 | .51316         | 3  |
| HGBTST1  | 9.8333 | .40415         | 3  |
| HGBTST2  | 10.3333| .46188         | 3  |
| HGBTST3  | 12.1333| .56862         | 3  |

### TABLE 3.3.1: Correlations of HGB results

|          | HGBCTRL | HGBTST1 | HGBTST2 | HGBTST3 |
|----------|---------|---------|---------|---------|
| HGBCTRL  | Pearson Correlation  | 1       | -.731   | -.956   | -.040   |
|          | Sig. (2-tailed)      | .478    | .189    | .975    |
|          | N                   | 3       | 3       | 3       |
| HGBTST1  | Pearson Correlation  | -.731   | 1       | .500    | .711    |
|          | Sig. (2-tailed)      | .478    | .667    | .497    |
|          | N                   | 3       | 3       | 3       |
| HGBTST2  | Pearson Correlation  | -.956   | .500    | 1       | -.254   |
|          | Sig. (2-tailed)      | .189    | .667    | .837    |
|          | N                   | 3       | 3       | 3       |
| HGBTST3  | Pearson Correlation  | -.040   | .711    | -.254   | 1       |
|          | Sig. (2-tailed)      | .975    | .497    | .837    |
|          | N                   | 3       | 3       | 3       |

Table 3.3 and Table 3.3.1 above shows a dose dependent increase in the hemoglobin concentrations (HGB).

### TABLE 3.4: Descriptive Statistics of the Haematocrit (HCT) results of Wistar Rats that were fed with Mucuna prurien Aqueous Leaf Extract

|          | Mean   | Std. Deviation | N  |
|----------|--------|----------------|----|
| HCTCTRL  | 27.3333| 2.30940        | 3  |
| HCTTST1  | 36.3333| 3.05505        | 3  |
| HCTTST2  | 39.6667| .57735         | 3  |
| HCTTST3  | 40.0667| .41633         | 3  |
TABLE 3.4.1: Correlations of HCT results

|       | HCTCTRL | HCTTST1 | HCTTST2 | HCTTST3 |
|-------|---------|---------|---------|---------|
| HCTCTRL Pearson Correlation | 1       | .756    | -1.000** | .277    |
| Sig. (2-tailed) | .454    | .000    | .821    |         |
| N     | 3       | 3       | 3       | 3       |
| HCTTST1 Pearson Correlation | .756    | 1       | -.756   | -.419   |
| Sig. (2-tailed) | .454    | .454    | .725    |         |
| N     | 3       | 3       | 3       | 3       |
| HCTTST2 Pearson Correlation | -1.000** | -.756   | 1       | -.277   |
| Sig. (2-tailed) | .000    | .454    | .821    |         |
| N     | 3       | 3       | 3       | 3       |
| HCTTST3 Pearson Correlation | .277    | -.419   | -.277   | 1       |
| Sig. (2-tailed) | .821    | .725    | .821    |         |
| N     | 3       | 3       | 3       | 3       |

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3.4 and Table 3.4.1 above shows a dose dependent increase in the hematocrit (HCT).

TABLE 3.5: Descriptive Statistics of the MCV results of Wistar Rats that were fed with *Mucuna pruriens* Aqueous Leaf Extract

|       | Mean | Std. Deviation | N  |
|-------|------|----------------|----|
| MCVCTRL | 67.3000 | 11.95115 | 3  |
| MCVTST1  | 96.5000 | 18.62122 | 3  |
| MCVTST2  | 92.9667 | 13.22964 | 3  |
| MCVTST3  | 62.7667 | 4.04145  | 3  |

**TABLE 3.5.1: Correlations of MCV results**

|       | MCVCTRL | MCVTST1 | MCVTST2 | MCVTST3 |
|-------|---------|---------|---------|---------|
| MCVCTRL Pearson Correlation | 1       | -.674   | -.140   | .786    |
| Sig. (2-tailed) | .529    | .911    | .425    |         |
| N     | 3       | 3       | 3       | 3       |
| MCVTST1 Pearson Correlation | -.674   | 1       | -.637   | -.987   |
| Sig. (2-tailed) | .529    | .560    | .104    |         |
| N     | 3       | 3       | 3       | 3       |
| MCVTST2 Pearson Correlation | -.140   | -.637   | 1       | .503    |
| Sig. (2-tailed) | .911    | .560    | .665    |         |
| N     | 3       | 3       | 3       | 3       |
| MCVTST3 Pearson Correlation | .786    | -.987   | .503    | 1       |
| Sig. (2-tailed) | .425    | .104    | .665    |         |
| N     | 3       | 3       | 3       | 3       |

Table 3.5 and Table 3.5.1 shows a relative increase in the mean corpuscular volume (MCV).
### TABLE 3.6: Descriptive Statistics of the MCH results of Wistar Rats that were fed with *Mucuna pruriens* Aqueous Leaf Extract

|            | Mean   | Std. Deviation | N  |
|------------|--------|----------------|----|
| MCHCTRL    | 20.8333| 4.20991        | 3  |
| MCHTST1    | 26.0333| 4.59384        | 3  |
| MCHTST2    | 24.1333| 3.55575        | 3  |
| MCHTST3    | 18.9667| 2.03060        | 3  |

### TABLE 3.6.1: Correlations of MCH Results

|            | MCHCTRL | MCHTST1 | MCHTST2 | MCHTST3 |
|------------|---------|---------|---------|---------|
| MCHCTRL    | Pearson Correlation | 1       | -0.095  | -0.050  | 0.313   |
|            | Sig. (2-tailed)      |         | 0.939   | 0.968   | 0.798   |
|            | N                   | 3       | 3       | 3       | 3       |
| MCHTST1    | Pearson Correlation | -0.095  | 1       | -0.989  | -0.975  |
|            | Sig. (2-tailed)      | 0.939   |         | 0.093   | 0.142   |
|            | N                   | 3       | 3       | 3       | 3       |
| MCHTST2    | Pearson Correlation | -0.050  | -0.989  | 1       | 0.933   |
|            | Sig. (2-tailed)      | 0.968   | 0.093   |         | 0.234   |
|            | N                   | 3       | 3       | 3       | 3       |
| MCHTST3    | Pearson Correlation | 0.313   | -0.975  | 0.933   | 1       |
|            | Sig. (2-tailed)      | 0.798   | 0.142   | 0.234   |         |
|            | N                   | 3       | 3       | 3       | 3       |

Table 3.6 and Table 3.6.1 above shows a relative increase in the mean corpuscular hemoglobin (MCH).

### TABLE 3.7: Descriptive Statistics of the MCHC results of Wistar Rats that were fed with *Mucuna pruriens* Aqueous Leaf Extract

|            | Mean    | Std. Deviation | N  |
|------------|---------|----------------|----|
| MCHCCTRL   | 30.8667 | 0.96090        | 3  |
| MCHTST1    | 27.1333 | 2.27450        | 3  |
| MCHTST2    | 26.0333 | 0.80829        | 3  |
| MCHTST3    | 30.2333 | 1.71561        | 3  |
TABLE 3.7.1: Correlations of MCHC Results

|               | MCHCCTRL | MCHCTST1 | MCHCTST2 | MCHCTST3 |
|---------------|----------|----------|----------|----------|
| MCHCCTRL     | Pearson Correlation | 1     | .918     | .781     | -.724    |
| Sig. (2-tailed) |          | .259   | .429     | .485     |
| N             |          | 3      | 3        | 3        | 3        |
| MCHCTST1     | Pearson Correlation | .918  | 1        | .965     | -.391    |
| Sig. (2-tailed) |          | .259   | .170     | .744     |
| N             |          | 3      | 3        | 3        | 3        |
| MCHCTST2     | Pearson Correlation | .781  | .965     | 1        | -.135    |
| Sig. (2-tailed) |          | .429   | .170     | .914     |
| N             |          | 3      | 3        | 3        | 3        |
| MCHCTST3     | Pearson Correlation | -.724 | -.391    | -.135    | 1        |
| Sig. (2-tailed) |          | .485   | .744     | .914     |
| N             |          | 3      | 3        | 3        | 3        |

Table 3.7 and Table 3.7.1 above shows a relative increase in the mean corpuscular hemoglobin concentration (MCHC).

TABLE 3.8: Descriptive Statistics of the Platelets (PLT) results of Wistar Rats that were fed with *Mucuna prurien* Aqueous Leaf Extract

|               | Mean   | Std. Deviation | N  |
|---------------|--------|----------------|----|
| PLTXCTRL     | 220.3333 | 129.45398     | 3  |
| PLTXTST1     | 168.3333 | 38.42308      | 3  |
| PLTXTST2     | 179.6667 | 9.01850       | 3  |
| PLTXTST3     | 394.3333 | 43.92418      | 3  |
### TABLE 3.8.1: Correlations of PLT Results

|          | PLTXCTRL | PLTXTST1 | PLTXTST2 | PLTXTST3 |
|----------|----------|----------|----------|----------|
| PLTXCTRL | Pearson Correlation | 1        | .286     | .965     | -.691    |
|          | Sig. (2-tailed)     | .815     | .169     | .514     | .494     |
|          | N                   | 3        | 3        | 3        | 3        |
| PLTXTST1 | Pearson Correlation | .286     | 1        | .025     | .493     |
|          | Sig. (2-tailed)     | .815     | .984     | .671     | .345     |
|          | N                   | 3        | 3        | 3        | 3        |
| PLTXTST2 | Pearson Correlation | .965     | .025     | 1        | -.857    |
|          | Sig. (2-tailed)     | .169     | .984     | .345     | .671     |
|          | N                   | 3        | 3        | 3        | 3        |
| PLTXTST3 | Pearson Correlation | -.691    | .494     | -.857    | 1        |
|          | Sig. (2-tailed)     | .514     | .671     | .345     | .671     |
|          | N                   | 3        | 3        | 3        | 3        |

Table 3.8 and Table 3.8.1 above increase in the platelet count (PLT) at higher dose of *Mucuna Prurien* aqueous leaf extract (1000mg/kg) when compared to the control.

### TABLE 3.9: Descriptive Statistics of the Lymphocytes (LYM) results of Wistar Rats that were fed with *Mucuna prurien* Aqueous Leaf Extract

|          | Mean   | Std. Deviation | N  |
|----------|--------|----------------|----|
| LYMCTRL  | 64.6667| 5.03322        | 3  |
| LYMTST1  | 70.0000| 5.29150        | 3  |
| LYMTST2  | 69.0000| 4.58258        | 3  |
| LYMTST3  | 67.3333| 6.42910        | 3  |

### TABLE 3.9.1: Correlations LYM Results

|          | LYMCTRL | LYMTST1 | LYMTST2 | LYMTST3 |
|----------|---------|---------|---------|---------|
| LYMCTRL  | Pearson Correlation | 1        | .676     | .737     | .886     |
|          | Sig. (2-tailed)     | .528     | .472     | .307     | .941     |
|          | N                   | 3        | 3        | 3        | 3        |
| LYMTST1  | Pearson Correlation | .676     | 1        | .000     | .941     |
|          | Sig. (2-tailed)     | .528     | 1.000    | .220     | .339     |
|          | N                   | 3        | 3        | 3        | 3        |
| LYMTST2  | Pearson Correlation | .737     | .000     | 1        | .339     |
|          | Sig. (2-tailed)     | .472     | 1.000    | .780     | .780     |
|          | N                   | 3        | 3        | 3        | 3        |
| LYMTST3  | Pearson Correlation | .886     | .941     | .339     | 1        |
|          | Sig. (2-tailed)     | .307     | .220     | .780     | .780     |
|          | N                   | 3        | 3        | 3        | 3        |

Table 3.9 and Table 3.9.1 above shows a dose dependent increase in the Lymphocytes (LYM) count indicating that those test parameters had higher Means compared to the controls.
TABLE 3.10: Descriptive Statistics of the Monocytes (MON) results of Wistar Rats that were fed with *Mucuna pruriens* Aqueous Leaf Extract

| Sample        | Mean   | Std. Deviation | N  |
|---------------|--------|----------------|----|
| MONCTRL       | 3.0000 | 1.00000        | 3  |
| MONTST1       | 2.3333 | 1.52753        | 3  |
| MONTST2       | 2.3333 | 1.52753        | 3  |
| MONTST3       | 2.3333 | .57735         | 3  |

TABLE 3.10.1: Correlations of MON Results

|              | MONCTRL | MONTST1 | MONTST2 | MONTST3 |
|--------------|---------|---------|---------|---------|
| MONCTRL      | Pearson Correlation | 1       | .655    | -.655   | -.866   |
|              | Sig. (2-tailed)     |         | .546    | .546    | .333    |
|              | N                   | 3       | 3       | 3       | 3       |
| MONTST1      | Pearson Correlation | .655    | 1       | .143    | -.189   |
|              | Sig. (2-tailed)     | .546    | .909    | .879    |         |
|              | N                   | 3       | 3       | 3       | 3       |
| MONTST2      | Pearson Correlation | -.655   | .143    | 1       | .945    |
|              | Sig. (2-tailed)     | .546    | .909    | .212    |         |
|              | N                   | 3       | 3       | 3       | 3       |
| MONTST3      | Pearson Correlation | -.866   | -.189   | .945    | 1       |
|              | Sig. (2-tailed)     | .333    | .879    | .212    |         |
|              | N                   | 3       | 3       | 3       | 3       |

Table 3.10 and Table 3.10.1 shows an observed difference in Monocytes (MON) when compared to the control.

TABLE 3.11: Descriptive Statistics of the Eosinophil (EOS) results of Wistar Rats that were fed with *Mucuna pruriens* Aqueous Leaf Extract

| Sample        | Mean   | Std. Deviation | N  |
|---------------|--------|----------------|----|
| EOSCTRL       | .6667  | .57735         | 3  |
| EOSTST1       | .3333  | .57735         | 3  |
| EOSTST2       | .3333  | .57735         | 3  |
| EOSTST3       | 1.0000 | .00000         | 3  |
### TABLE 3.11.1: Correlations of EOS Results

|       | EOSCTRL | EOSTST1 | EOSTST2 | EOSTST3 |
|-------|---------|---------|---------|---------|
| EOSCTRL Pearson Correlation | 1 | -1.000** | .500 | .b |
| Sig. (2-tailed) | .000 | .667 | . |
| N | 3 | 3 | 3 | 3 |
| EOSTST1 Pearson Correlation | -1.000** | 1 | -.500 | .b |
| Sig. (2-tailed) | .000 | .667 | . |
| N | 3 | 3 | 3 | 3 |
| EOSTST2 Pearson Correlation | .500 | -.500 | 1 | .b |
| Sig. (2-tailed) | .667 | .667 | . |
| N | 3 | 3 | 3 | 3 |
| EOSTST3 Pearson Correlation | .b | .b | .b | .b |
| Sig. (2-tailed) | . | . | . | . |
| N | 3 | 3 | 3 | 3 |

**. Correlation is significant at the 0.01 level (2-tailed).

b. Cannot be computed because at least one of the variables is constant.

Table 3.11 and Table 3.11.1 above shows no difference in the Eosinophil (EOS) tests as compared to the control.

### TABLE 3.12: Descriptive Statistics of the Neutrophil (NEU) results of Wistar Rats that were fed with *Mucuna prurien* Aqueous Leaf Extract

|        | Mean  | Std. Deviation | N  |
|--------|-------|----------------|----|
| NEUCTRL | 31.6667 | 3.51188 | 3 |
| NEUTST1 | 27.3333 | 4.04145 | 3 |
| NEUTST2 | 29.6667 | 8.02081 | 3 |
| NEUTST3 | 29.3333 | 6.80686 | 3 |
### TABLE 3.12.1: Correlations of NEU Results

|               | NEUCTRL | NEUTST1 | NEUTST2 | NEUTST3 |
|---------------|---------|---------|---------|---------|
| **NEUCTRL**   | Pearson Correlation | 1       | .822    | .509    | .927    |
|               | Sig. (2-tailed)      | .386    | .660    | .244    |
|               | N                   | 3       | 3       | 3       |
| **NEUTST1**   | Pearson Correlation | .822    | 1       | -.072   | .975    |
|               | Sig. (2-tailed)      | .386    | .954    | .141    |
|               | N                   | 3       | 3       | 3       |
| **NEUTST2**   | Pearson Correlation | .509    | -.072   | 1       | .150    |
|               | Sig. (2-tailed)      | .660    | .954    | .904    |
|               | N                   | 3       | 3       | 3       |
| **NEUTST3**   | Pearson Correlation | .927    | .975    | .150    | 1       |
|               | Sig. (2-tailed)      | .244    | .141    | .904    |
|               | N                   | 3       | 3       | 3       |

Table 3.12 and Table 3.12.1 above shows an observed difference in Neutrophil (NEU) tests when compared to the control.

**DISCUSSION**

The result of the *Mucuna Pruriens* aqueous leaf extract shows statistically significant increase in the weight of Wister rats as shown in Table 2, Table 2.1, Table 2.2 and Graph 1. The results of the haematological parameters of wistar rats was presented in Table 3. There was no statistically significant correlation between the test groups and the control which agrees with the study of Tende *et al.* Descriptive statistics were used to describe the means for each parameters; indicating test parameters had higher means compared to controls for most of them. This supports the understanding that the active substance increased the haematology parameters in the test group.

A dose dependent increase in the white blood cells (WBC), hemoglobin concentrations (HGB), hematocrit (HCT), and Lymphocytes (LYM) count was observed across the test as shown in the descriptive statistics in Table 3.1, Table 3.3, Table 3.4, and Table 3.9 indicating that those test parameters had higher Means compared to the controls which support the understanding according to the study of Madukwe *et al* that the active substance of Mucuna pruriens increased the haematology parameters but is contrary to the findings of Ndukwe *et al.* A relative increase was observed in the red blood cell counts (RBC), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC) as shown in Table 3.2, Table 3.5, Table 3.6, and Table 3.7. The Platelet count (PLT) also shows an increase at higher dose of *Mucuna Pruriens* aqueous leaf extract (1000mg/kg) when compared to the control (Table 3.8). There was an observed difference in Monocytes (MON) and Neutrophil (NEU) tests when compared to the control (Table 3.10 and Table 3.12). There was no difference observed in the Eosinophil (EOS) tests as compared to the control (Table 3.11).
CONCLUSION

This study showed that Mucuna Prurien aqueous leaf extract produced significant increase on the weight and on the Total Red blood cell count especially in the parameter of PCV, HB, MCV, MCHC, and shows significant change in erythropoiesis. There is also a significant change observed on the Total white cells count and level of lymphocytes respectively. Hence, Mucuna Prurien has the ability to increase haemoglobin level and can be used for the treatment of anaemia. But despite of the popularity of these plants been used as herbal blood boosters, been known to enhance the haemopoeitic system; the impaired white blood cell production effect will definitely limit their use.

RECOMMENDATION

This research therefore recommends further study on Mucuna Prurien especially in finding out the lethal dose, the phytochemical constituents, and the identification of the plant component that is responsible for the observed leucopoenia so that it can be safer for use in treatment of anaemia.

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