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

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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 leucopoenia 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-hydroxytryptanine (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 T1R2 T1R3	 1400g 1300g 1300g	 1300g 1200g 1300g	 1400g 1300g 1300g
SAMPLE T2R1 T2R2 T2R3	, 1300g 1400g 1300g	 1400g 1500g 1400g	 1500g 1400g 1400g
T3R1 T3R2 T3R3	1400g 1300g 1500g	1600g 1500g 1600g	1600g 1500g 1600g
T4R1 T4R2 T4R3	1400g 1400g 1300g	1700g 1600g 1700g	1700g 1800g 1700g
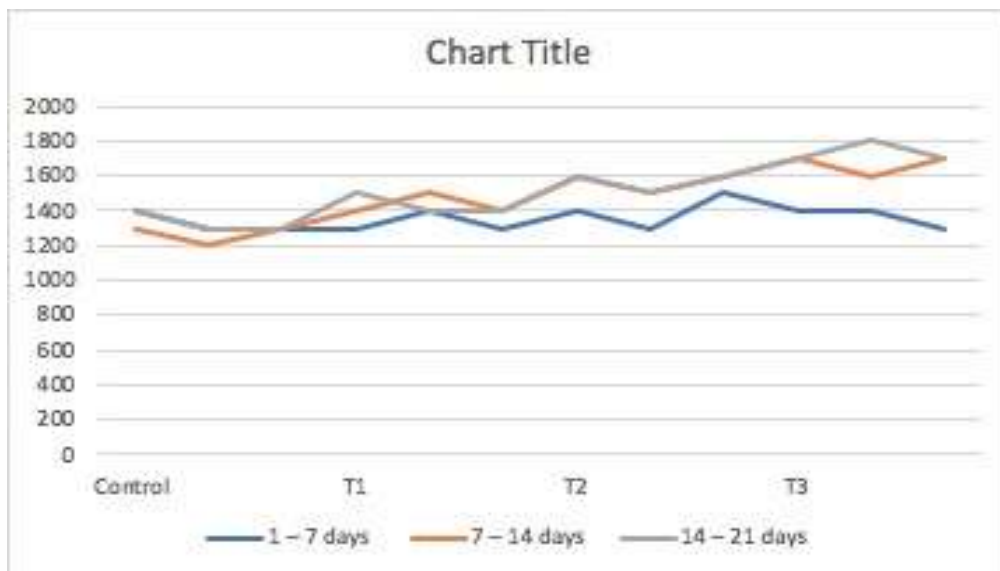
Graph 1: Graph showing the Change in weight of the Wistar Rats Administered with Mucuna pruriens Leaves Extracts at different time points.

The graph 1 above shows a statistically significant increase in the weight of Wister rats

TABLE 2.1: ANOVA SUMMARY TABLE

Anova: Two-Factor With Replication				
SUMMARY	1 – 7 days	7 – 14 days	14 – 21 days	Total
Control				
Count	4	4	4	12
Sum	5300	5200	5500	16000
Average	1325	1300	1375	1333.33333
Variance	2500	6666.66667	9166.66667	6060.60606
Count	4	4	4	12
Sum	5400	6000	5900	17300
Average	1350	1500	1475	1441.66667
Variance	3333.33333	6666.66667	9166.66667	9924.24242
Count	4	4	4	12
Sum	5600	6600	6800	19000
Average	1400	1650	1700	1583.33333
Variance	6666.66667	3333.33333	6666.66667	23333.3333
Total				
Count	12	12	12	
Sum	16300	17800	18200	
Average	1358.33333	1483.33333	1516.66667	
Variance	4469.69697	26969.697	26969.697	

TABLE 2.2: ANOVA: Weight of Wister Rats

ANOVA						
Source of Variat.	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	83611.1111	13.8923077	7.1043E-05	3.35413083
Interaction	102777.778	4	25694.4444	4.26923077	0.0083382	2.72776531
Within	162500	27	6018.51852			
Total	809722.222	35				

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 (fI)	MCH (pg)	MCHC(g/dl)	PLTX10³	Lymph (%)	Mono	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 heamatological 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 prurien* 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	3
HGBTST1	Pearson Correlation	-.731	1	.500	.711
	Sig. (2-tailed)	.478		.667	.497
	N	3	3	3	3
HGBTST2	Pearson Correlation	-.956	.500	1	-.254
	Sig. (2-tailed)	.189	.667		.837
	N	3	3	3	3
HGBTST3	Pearson Correlation	-.040	.711	-.254	1
	Sig. (2-tailed)	.975	.497	.837	
	N	3	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 prurien* 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 prurien **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	-.095	-.050	.313
	Sig. (2-tailed)		.939	.968	.798
	N	3	3	3	3
MCHTST1	Pearson Correlation	-.095	1	-.989	-.975
	Sig. (2-tailed)	.939		.093	.142
	N	3	3	3	3
MCHTST2	Pearson Correlation	-.050	-.989	1	.933
	Sig. (2-tailed)	.968	.093		.234
	N	3	3	3	3
MCHTST3	Pearson Correlation	.313	-.975	.933	1
	Sig. (2-tailed)	.798	.142	.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 prurien **Aqueous Leaf Extract**

	Mean	Std. Deviation	N
MCHCCTRL	30.8667	.96090	3
MCHCTST1	27.1333	2.27450	3
MCHCTST2	26.0333	.80829	3
MCHCTST3	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
	N	3	3	3	3
PLTXTST1	Pearson Correlation	.286	1	.025	.494
	Sig. (2-tailed)	.815		.984	.671
	N	3	3	3	3
PLTXTST2	Pearson Correlation	.965	.025	1	-.857
	Sig. (2-tailed)	.169	.984		.345
	N	3	3	3	3
PLTXTST3	Pearson Correlation	-.691	.494	-.857	1
	Sig. (2-tailed)	.514	.671	.345	
	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
	N	3	3	3	3
LYMTST1	Pearson Correlation	.676	1	.000	.941
	Sig. (2-tailed)	.528		1.000	.220
	N	3	3	3	3
LYMTST2	Pearson Correlation	.737	.000	1	.339
	Sig. (2-tailed)	.472	1.000		.780
	N	3	3	3	3
LYMTST3	Pearson Correlation	.886	.941	.339	1
	Sig. (2-tailed)	.307	.220	.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 prurien* Aqueous Leaf Extract

	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 prurien* Aqueous Leaf Extract

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