BIOCHEMICAL AND HAEMATOLOGICAL EFFECT OF THREE MEDICINAL PLANTS EXTRACT USED THERAPEUTICALLY ON BROILER CHICKENS AS ANTICOCCIDIAL AND GROWTH PROMOTER

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ABSTRACT

This study was conducted to investigate the effect of three different medicinal plants extract (Aristolochia ringens, Allium sativum, and Ocimum gratissimum) on firm hematological and serum biochemistry of broiler chicken infected with coccidiosis. Two hundred and fifty Day old arbor-acre breed broiler birds were shared into three treatments with three replicates per dosages of the extracts and two controls. The plants extract administered at different dosages (20ml, 30ml, and 40ml). The results showed that there was no significant alteration in PCV and RBCs in the broiler chicken administered with the three different medicinal plants extract the HBC, MCV likewise, MCHC and MCH showed that there was no significant difference (P>0.05) in the extract administered. There is a slight alteration in the number of lymphocyte, neutrophil, basophil, and eosinophil of the broiler. The biochemical resultshowed that the Total Protein (TP) to be slightly different (P<0.05) in Aristolochia ringens,and no significantly different (P>0.05) among other plants extract, there is not significantly different (P>0.05) in Albumin, Globulin, Aspartate aminotransferase and Alanine aminotransferase throughout the treatments.

Keywords: Haematological, Biochemical, Aristolochia, Allium sativum, Ocimum.

INTRODUCTION

Herbal medicine also called botanical medicine, or phytomedicine refers to using a plant's seeds, berries, roots, leaves, bark, or flowers for medicinal purposes. Herbalism has a long tradition of use outside of conventional medicine. It is becoming mainstream as improvements in analysis and quality control along with advances in clinical research shows the value of herbal medicine in the treating and preventing disease (Abeloff, 2008). Plants had been utilized for therapeutic purposes sometime before written history. Antiquated Chinese and Egyptian papyrus compositions depict restorative uses for plants as ahead of schedule as 3,000 BC. Indigenous societies, (for example, African and Native American) utilized herbs in their recuperating customs, while others created conventional therapeutic frameworks, (for example, Ayurveda and Traditional Chinese Medicine) in which home-grown treatments were utilized. Analysts found that individuals in various parts of the world tended to utilize the same or comparable plants for similar purposes.

In the mid-nineteenth century, when compound examination initially ended up noticeably accessible, researchers started to separate and alter the dynamic fixings from plants. Afterward, physicists started making their variant of plant mixes and, after some time, the utilization of

natural solutions declined for drugs. Just about one-fourth of pharmaceutical medications are gotten from botanicals. As of late, the World Health Organization evaluated that 80% of individuals overall depend on homegrown drugs for some piece of their essential social insurance. In Germany, around 600 - 700 plant-based pharmaceuticals are accessible and are recommended by somewhere in the range of 70% of German doctors. In the previous 20 years in the United States, open disappointment with the cost of professionally prescribed solutions joined with an enthusiasm for coming back to standard or natural cures has prompted an expansion in homegrown drug utilize (Damery *et al*., 2011). Extracts evaluated included cold water extract, hot water extract, and steam distillation extract. Only the steam distillation extract had inhibitory effects on the selected bacteria, and the minimum inhibitory concentration ranged from 0.1% for *S.aureus* to 0.01% for *E. coli* and *S. Typhimurium*, and 0.001% for *S. Typhi* (Kabir *et al*., 2005).

MATERIALS AND METHOD

The study lasted eight weeks. The poultry pens used for the study were thoroughly washed and disinfected before the arrival of the experimental birds. Wood shavings and charcoal pot well positioned before the arrival of the experimental birds.

Experimental site

The trial was carried out over a period of 56 days in an open-sided and deep litter house at the Poultry Unit of the Teaching and Research Farm of the Federal University of Technology, Akure (FUTA).

Experimental design

The experiment was triedin theform of a Completely Randomized Design (CRD). A total of 330 marshal broiler chicks, obtained from the hatchery of Obasanjo farms, were divided into eleven treatments, where treatment1 (T1) served as the positive control which was received synthetic drug and treatment 2 (T2) served as negative control. Treatments 3-11 received the herbal extract from three herbs, i.e., Garlic (*A.sativum*) bulb, *A.ringens,O.gratissium* leaves at different levels of inclusion in drinking water. Each treatment had three replicates of 10 chicks per replicate. Twenty percent 20% concentration of plant extracts were given at the rate of 40, 30, and 20ml per liter of water. These were served prophylactically for four weeks before the birds were challenged with coccidial oocyst and continuous as therapeutics.

TREATMENTS	DETAILED
1	Positive control with synthetic drug (Coccifor^{R}) at 10g/10litre of drinking water
2	Negative control with no synthetic drug or herbal extract
3	*A.ringens* extract at 20ml/l drinking water
4	*A.ringens* extract at 30ml/l drinking water
5	*A.ringens* extract at 40ml/l drinking water
6	*A.sativum* extract at 20ml/l drinking water
7	*A.sativum* extract at 30ml/l drinking water
8	*A.sativum* extract at 40ml/l drinking water
9	*Ocimum grattissium*extract at 20ml/l drinking water

10	*Ocimum grattissium* extract at 30ml/l drinking water
11	*Ocimum grattissium*extract at 40ml/l drinking water

Blood sample

Blood samples were collected after the first four weeks of the experiment to determine the performance of the birds due to the effects of plant extract used on the chickens. After slaughtering, blood samples were instantly centrifuged at 3500 rpm for 15 minutes. Serum was decanted after centrifugation of the clotted blood, stored at 4^0Ċ in the deep freezer until the time of chemical determinations. The biochemical qualities of blood were resolved colorimetrically, utilizing business Kits as previously described (Ragab, 2001).

Serum Collection

The blood sample put into sample test tubes during the collection of the sample was brought to the laboratory in a slanted test tube holder and then allowed to stand for about 4-5 hours in a vertical but slanted position till it clotted. At the end of the period, a straw-colored liquid (serum) was produced on the top of the clotted blood. The blood was then separated by decanting from the test tube into a cryo-preservation container and stored in a freezer at -20^0c before used.

Haematological Studies

The blood tests in the EDTA bottle were utilized for hematological investigation to decide hematology variable, for example, Packed Cell Volume (PCV), Erythrocyte Count (RBC), Leucocytes Count (WBC), Hemoglobin Concentration (Hb), Mean Corpuscular Volume(MCV), Mean Corpuscular Haemoglobin(MCH), and Mean Corpuscular Hemoglobin Concentration (MCHC).

Biochemical Analysis

The collected and stored serum was analyzed for the determination of Total Protein (TP), Globulin, Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST) and Alkaline Phosphatase (ALP) activities were determined using a Biochemical Parameter Kit from Randox Laboratories Limited Ardmore, Oklahoma, United States of America.

Data Analysis

The statistical analysis system (SAS, 2000) was used to determine the descriptive statistics of the mean, range and standard deviation of hematological and serum biochemical data. The mean data was analyzed by a comparison with the reference interval value.

RESULT AND DISCUSSION

The results and discussions for the biochemical parameters of broiler chickens on the three different medicinal plants extract *(Aristolochia ringens, Allium sativum, and Ocimum gratissimum) as a*growth promoter and anti-coccidial is presented in Table 4.1and hematological characteristics is shown in table 4.2.

Biochemical Parameter

The biochemical properties showed in Table 4.1 the parameters present the result after the biochemical analysis had been carried out on broiler chickens placed on three different medicinal plants extract therapeutically after experimental infection.

Total Protein (TP)

There is no significant different (P>0.05) in Total protein (TP) value of broiler administered with T5, T6, and T9. Also, total protein value in T8, T11 including the negative and positive control show no different, but differences are exhibited in all other treatments considering Total protein (TP) value.

Albumin

Albumin value (ALB) in broiler treated with T5 (9.53 ± 2.42^{b}), T6 (5.76 ± 1.42^{b}), T7 (9.13 ± 3.29^{b}), T8 (10.92 ± 5.12^{b}) and T11 (9.13 ± 2.10^{b}) are not significant different but slight differences (P<0.05) are exhibited in T4 (24.55 ± 2.07^{a}) and T1 (16.82 ± 5.46^{ab}) and T2 (15.88 ± 2.27^{ab}).

Globulin (GLB)

Globulin (GLB) of the broiler in treatment T3 (20.60 ± 6.25^{bcd}), T8 (23.49 ± 5.34^{bcd}), T10 (29.37 ± 7.18^{bcd}), T11 (25.24 ± 6.34^{bcd}) shows similar result, there is no significant different (P>0.05), inclusively, T5 (47.43 ± 2.02^{a}), T6 (49.48 ± 3.07^{a}) and T9 (38.47 ± 6.63^{ab}) exhibit very strong similarities, T7 (35.46 ± 5.08^{abc}) shows slight similarities but cannot be compared to T5 (47.43 ± 2.02^{a}) and T6 (49.48 ± 3.07^{a}).

Aspartate aminotransferase

Aspartate aminotransferase in T1 (74.67±8.69a) and T8 (27.00±4.00d) are distinctive substantially (P<0.05) contrast with an incentive in alternate medicines, that display hints of similitudes, however, these likenesses are marginally shown and not as articulated (P>0.05) as T4 (46.50±4.35abcd), T5 (50.83±7.33abcd), T6 (49.25±14.02abcd), T10 (55.25±10.10abcd) and T11 (49.00±18.00abcd).

Alanine aminotransferase

There is no significant different (P>0.05) in Alanine aminotransferase of the broiler in all treatments except T8 (12.67 ± 5.65^{b}) and T11 (35.83 ± 13.62^{a}) that are significantly different (P<0.05) to each other.

Haematological Parameter

Table 4.2 shows the hematological parameter of the broiler chickens placed on three different

medicinal plants extracts therapeutically after experimental infection.

Packed Cell Volume (PCV)

Packed Cell Volume (PCV) of the birds in all treatments shows that there is no significant different (P>0.05) in the count of cell volume except the Packed cell volume of the birds placed T4(28.40±2.23^{b}) and T9 (33.20±0.49^{a}) are significantly different (P<0.05) to each other.

Red blood cell (RBC)

Red blood cell (RBC) properties are not significantly different (P>0.05) down all the treatments but the Red blood cell of birds in T4(1.07±0.49^{b}) are different significantly (P<0.05) to birds in other. Lymphocyte is fundamentally unique (P<0.05) from 30ml Allium sativum (68.00±0.52a) to 20ml Allium sativum (63.00±1.03b) however there are no distinctions (P>0.05) between 40ml/litre (64.17±1.60ab) and 30ml Aristolochia ringens (65.20±2.18ab) additionally T2 which are the winged animals (grill) without treatment and 20ml Aristolochia ringens are not quite the same as each other (P>0.05).

Mean Cell Haemoglobin Concentration (MCHC)

The MCHC (mean cell hemoglobin concentration) measures the average deliberation of hemoglobin in red blood cell. From the result presented in Table 4.2 there is also no significant different (P>0.05) except the T2(32.19±1.18^{b}) and T1(33.74±0.32^{a}) that differ significantly (P<0.05) from each other, meanwhile, MCH and MCHC show the same property from the result presented in Table 4.2.

Mean Cell Haemoglobin

The Mean Cell Hemoglobin (MCH) esteem demonstrate that there is no considerable contrast (P>0.05) in the medications, aside from T2(3.22±0.12b) and T1(3.37±0.03a) which demonstrate the noteworthy distinction (P<0.05) in the RBC of the chickens set on Aristolochia ringens.

Table 4.1: BIOCHEMICAL PROPERTIES

TREATMENT	TP (g/dl)	ALB (g/dl)	GLOBULIN (g/dl)	AST (UI)	ALT (UI)
T1	35.06±8.08^{cd}	16.82±5.46^{ab}	18.24±13.42^{cd}	74.67±8.69^{a}	17.50±4.01^{ab}
T2	31.53±2.30^{cd}	15.88±2.27^{ab}	15.66±2.78^{d}	70.50±18.50^{ab}	30.00±5.42^{ab}
T3	29.43±5.17^{d}	8.83±3.85^{b}	20.60±6.25^{bcd}	35.00±3.89^{cd}	24.83±4.09^{ab}
T4	41.42±3.83^{bcd}	24.55±2.07^{a}	16.87±2.67^{d}	46.50±4.35^{abcd}	20.00±3.53^{ab}
T5	56.95±1.70^{a}	9.53±2.42^{b}	47.43±2.02^{a}	50.83±7.33^{abcd}	24.17±6.04^{ab}
T6	55.24±3.29^{ab}	5.76±1.42^{b}	49.48±3.07^{a}	49.25±14.02^{abcd}	21.67±5.35^{ab}
T7	44.59±4.00^{abc}	9.13±3.29^{b}	35.46±5.08^{abc}	41.00±7.23^{bcd}	17.50±6.29^{ab}
T8	34.41±2.42^{cd}	10.92±5.12^{b}	23.49±5.34^{bcd}	27.00±4.00^{d}	12.67±5.65^{b}
T9	52.38±1.22^{ab}	13.92±6.21^{ab}	38.47±6.63^{ab}	64.67±5.67^{abc}	21.50±1.26^{ab}
T10	42.68±5.71^{bcd}	13.31±3.55^{ab}	29.37±7.18^{bcd}	55.25±10.10^{abcd}	17.50±2.00^{ab}
T11	34.37±7.61^{cd}	9.13±2.10^{b}	25.24±6.34^{bcd}	49.00±18.00^{abcd}	35.83±13.62^{a}

Mean ± Standard Error of Mean

a,b,c,d = Means on the same column but with different superscripts are statistically ($P<0.05$) significant.

TP=Total protein; ALB=Albumin; GLB=Globulin; GLU=Glucose; ALP=Alkaline Phosphatase; ALT=Alanine aminotransferase; AST=Aspartate aminotransferase.

T1: Control A standard drug, T2: Control B water, T3:20ml *A.ringens*, T4:30ml *A.ringens*, T5:40ml *A.ringens*, T6:20ml *A.sativum*, T7: 30ml *A.sativum*, T8:40ml *A.sativum*,T9:20ml *Ocimum grattissium*, T10: 30ml *Ocimum grattissium*, T11: 40ml*Ocimum grattissium*

Table 4.2: Haematological variables

	Lev ml/litre	HAEMATOLOGICAL								
		ESR	PCV	RBC	HB	LYM	NEU	MONO	BAS	EOS
ContrlA		1.50±0.22	29.83±1.68	216.00±32.27	9.93±0.55	66.50±1.06	19.17±1.01	10.33±0.76	2.50±0.22	1.50±0.34
ContrlB		1.33± .33	31.33±2.19	213.33±21.40	10.43± 0.72	62.00± 0.58	24.00± 1.15	10.00± 0.58	2.67± 0.33	1.33± 0.33
Plant										
Aristotle	20	1.33±0.21	30.67±1.26	207.33±15.68	10.22±0.42	65.67±1.36	19.33±1.26	11.50±0.99	2.67±0.33	0.83±0.31
	30	1.80± 0.58	28.40±2.23	193.60±12.73	9.58± 0.74	65.20 ± 2.18	20.80 ± 1.46	10.40± 1.03	2.60 ± 0.24	1.00±0.32
	40	1.33± 0.21	32.83±2.18	208.83±10.07	10.45±0.32	64.17 ± 1.60	22.33 ± 1.15	9.83 ± 0.95	2.33 ± 0.21	1.33± 0.33
Garlic	20	1.17± 0.17	31.17±0.70	209.00±7.28	10.40±0.23	63.00 ± 1.03	21.50 ± 1.45	11.67 ± 0.76	2.33± 0.21	1.50± 0.22
	30	1.00± 0.00	31.83±0.54	215.67±7.90	10.62±0.18	68.00± 0.52	18.67± 0.42	9.83 ± 0.54	2.67± 0.33	0.83± 0.31
	40	1.33± 0.33	29.67±1.05	193.33±9.26	9.88± 0.36	64.83 ± 1.89	19.50 ± 1.26	11.67 ± 0.88	2.50 ± 0.22	1.50± 0.22
Ocimum	20	1.00± 0.00	33.20±0.49	233.40±11.40	11.08±0.17	66.20± 1.39	20.40 ± 1.08	9.60± 0.81	2.40 ± 0.24	1.40± 0.24
	30	1.00± 0.00	32.50±0.50	222.17±6.01	10.82±0.17	64.83 ± 1.05	20.67 ± 1.02	10.83± 0.65	2.33± 0.21	1.33± 0.33
	40	1.17± 0.17	31.17±0.70	205.50±7.88	10.45±0.26	66.00± 1.86	20.00± 1.15	10.00± 0.73	2.83 ± 0.31	1.17± 0.31
Mean separation										
Plants										
Aristolochia		1.47± 0.19	30.76±1.12	203.82±7.28	10.11± 0.28	65.00± 0.93	20.82± 0.76	10.59 ± 0.56	2.53 ± 0.15	1.06 ± 0.18
Garlic		1.17± 0.12	30.89±0.48	206.00± 4.99	10.30± 0.16	65.28 ± 0.85	19.89± 0.68	11.06± 0.45	2.50 ± 0.15	1.28 ± 0.16
Ocimum		1.06± 0.06	32.24±0.38	219.59± 5.33	10.76± 0.13	65.65 ± 0.82	20.35 ± 0.59	10.18 ± 0.41	2.53 ± 0.15	1.29 ± 0.17
Level										

0	1.44± 0.18	30.33±1.28	215.11±21.73	10.10±0.42	65.00± 1.03	20.78± 1.09	10.22 ± 0.52	2.56 ± 0.18	1.44 ± 0.24
20	1.18± 0.10	31.59±0.56	215.59±7.13	10.54± 0.19	64.88 ± 0.77	20.41 ± 0.74	11.00 ± 0.52	2.47 ± 0.15	1.24 ± 0.16
30	1.24± 0.18	31.06± 0.78	211.47± 5.62	10.38± 0.25	66.06 ± 0.79	20.00 ± 0.59	10.35± 0.41	2.53± 0.15	1.06 ± 0.18
40	1.28± 0.14	31.22± 0.85	202.56± 5.20	10.26± 0.18	65.00± 0.99	20.61 ± 0.71	10.50 ± 0.51	2.56± 0.15	1.33 ± 0.16
Statistical significant									
Treatment	0.2244	0.4828	0.6809	0.2156	0.4390	0.1360	0.7049	0.9954	0.7211
Level	0.7244	0.8071	0.6827	0.6680	0.7323	0.8882	0.7169	0.9783	0.5500
Treatment*Levl	0.5158	0.0764	0.5180	0.2333	0.1074	0.1052	0.1434	0.2937	0.3740

Mean ± standard deviation**,** Comparison of means with Control were not significant
Factorial analysis based on three plants and three levels
ControlA positive control with synthetic drug (Coccifor^{R}) in drinking water
ControlB negative control with no synthetic drug or herbal extractESR = Erythrocyte sedimentation rate, PCV=Packed cell volume, RBC=Red blood cell, Hb=Hemoglobin, MCHC=Mean cell hemoglobin concentration, MCH=Mean cell hemoglobin, MCV=Mean cell volume, LYM=lymphocyte, NEU=Neutrophils, MONO=Monocyte, BAS=Basophil and EOS=Eosinophil

DISCUSSION

It was observed from the result presented that Total protein (TP) value of broiler chicken administered with a high dosage of the *Aristolochia Ringen*increases respectively. Considering the rate at 30ml, Total Protein is at normal range likewise in 20ml of *Aristolochia ringen*. Thus, the difference between the 40ml/liter (56.95±1.70^{a})and 20ml *Aristolochia Ringen*(29.43±5.17^{d}) is significantly visible. Despite the fact that the estimations of the three doses demonstrate that TP is at the typical range yet the Total protein at 40ml Aristolochia Ringen increments than 30ml and 20ml Aristolochia ringen. The Total Protein (TP) in the controls are standard.

Allium sativum at 20ml/liter (55.24±3.29^{ab}) shows avaluable result as it is characterized in 40ml/liter of A. *Ringen.* The birds maintain the normal range of Total protein value, comparing with 30ml *Allium sativum* (44.59±4.00^{abc}) there is no different, but TP value increases in 20ml *Allium sativum*. There is a significant difference in the TP of 20ml and 40ml dosage of garlic which means there is a slight alteration in the activities of the extract at high dosage. Nakagawa *et al.*,(1980) found that raw garlic juice at a dose 5ml/kg as resulted in death in rats due to a stomach injury. Similarly, Augusti (1996) found prolong feeding of high levels of raw garlic in rats have resulted in anemia.

The activities of *Ocimum grattissium* are stable and efficient; there is a significant decrease in the Total protein values as the dosages increases. Despite the decrease there is no significant difference (P>0.05) in the 20ml and 30ml as it is presented in table likewise the difference in the dosage 30ml, and 40ml is visible but slight difference can be observed in 20 ml (52.38±1.22^{ab}) and 40 ml (34.37±7.61^{cd}) there is reduction in the TP present in the blood of the broiler chickens administered at high dosage of *Ocimum grattissium*. Comparing the literature value range presented by Spector (1961); Schermer (1967); Samdieh*et al.*,(1969);

Altman and Dittmer (1974) to the values derived from this experiment, it is noticed that the albumin is at thestandard range. There are significant differences in the activities of the serum albumin of the broiler chickens administered with the three medicinal plants extract at a different level of dosages.

Considering the albumin value,*A. Ringen*. There is no significant different (P<0.05) in the Albumin value of the broiler chicken administered with*Aristolochia ringens.*The controls show no differences (P<0.05) in Albumin values derived in the broiler chickens placed on the three medicinal plants extract. *Allium sativum*shows the higher the dosage, the higher the Albumin value.The Albumin increases progressively as the level of dosage increases.

Globulins arethe family of globular proteins that have higher molecular weight and water solubility values than the Albumins. A few globulins are created in the liver, while others are made by the resistant framework. Globulins, albumin, and fibrinogen are the major blood proteins. The typical blood concentration of globulins in the blood is about 2.6-4.6 g/dl (Harris *et al.,* 1935). The Globulin in the birds with the *Aristolochia Ringen* at 40ml dosage has an increased value which can be compared with the significance of total protein at a similar dosage. These make the difference in a range of dosages evident. The number of globulins decreases in the blood of the birds treated with various dosages of Garlic as it is experimental in the TP value.

The result shows that the activities of AST in the broiler chickens administered with the three medicinal plants extract was markedly affected at the various dosages. Alanine aminotransferase is an enzyme primarily found in the liver and kidney.The resultshows that Alanine aminotransferase in broilers with*A.ringen* at different dosageswas at the normal range for chicken (Spector, 1961). It was evident that the liver of the birds placed on the various dosages of *A.ringen* was not altered by any infection. Wang *et al.,* (2012) suggested that significantly elevated level of ALT may be as a result of diseased liver or response to strenuous exercise. The ALT value of the birds in the positive control which were handled with anti-coccidial(coccifor^{R}) shows that they have reduced ALT value that is lower than the average range for the chicken, the result of birds in negative control that is without any treatment has an increased value comparing to positive control.

It might be due to slight infection coccidiosis in the liver of the birds.*Ocimum grattissium*at 40ml/literis revealedthe highest level of ALT throughout all the dosages of all the medicinal plants extract; this might be due to anenvironmental factor, Albritton (1961) presented the standard hemoglobin value (7.50-13.1). The study revealed hemoglobin in broiler chickens administered with the three medicinal plants extract at various dosageswere within the reasonable range value recommended. Reduction in the hemoglobin may be accompanied by a fall in the red cell count (RBC) and packed cell volume (hematocrit). The primary function of the red blood cells is to transport hemoglobin, which in turn carries oxygen from the lungs to the tissues (Dacie *et al.,*1995).

The Hb values of the broilers treated with the three plants extract showed no significant difference. The significant difference in Hb value of 30ml *A. Ringen* and 20ml *Ocimum grattissium* might be due to an environmental factor. The Hb values derived from this

experiment was similar to that of Muhammad *et al*., (2009) who recorded the Hb value for broiler chicks fed *aspergillus niger* –fermented,*Terminalia catappa* seed meal-based diet.

Altman and Dittmer (1974), stated the chicken Packed Cell Volume (PCV) values ranges from 26.0-45.2. The result showed that PCV of the broiler chickens administered with the three medicinal plants extract at various dosages were normal since the values were within the normal range for chicken. The result presented showed that there is no significant differencein the PCV value of the birds in all the treatments except in 30ml/liter*A. Ringen* and 20ml/liter*Ocimum grattissium* that significantly different to the value from dosages of other extracts. The PCV values derived from this experiment was similar to that of Ala Al Deen (2007) who recorded the PCV broiler fed with garlic. The result showed that the concentration of the RBC in the blood of some broiler chickens from this study was altered by the infection of the coccidial challenge due to the variation in the anticoccidial effect of the extract at a different dosage. The differencesare shownat 30ml/liter*A.ringens* and 40ml/liter*Allium sativum* might be due to overcrowding, while the difference might be as a result of aninvasion of coccidia agent in the negative control and under-dosage might causethat of 20ml/liter*Ocimum grattissium*.

Comparative results of the obtained data and the standard value indicated by Irizaary-Rovira (2004) andWakenell(2010) showed that coccidiosis caused by *E. tenella* and *E. Brunette* induced a higher reduction in RBC and PCV. The reduction in the RBC is due to the loss of blood into the gastrointestinal tract and infectious disease (Irizaary-Rovira, 2004). The result showed that the values derived from all the treatments are not significantly different ($p>0.05$) to each other and they fall within the normal range of MCHC value (26–35) for chicken (Wakenell 2010). Wakenell (2010) presented normal MCH range value for chickens as 33–47. The result of MCH of the birds administered with the three plants extract and the controls are highly reduced to standard range value. This means the amount hemoglobin of the birds used for this study is low compared to the value derived in the study presented by Madubuike *et al.*,(2006).

The MCV value derived from the experiment is reasonableto compare to normal range (90–140) as it was presented by Wakenell (2010). There is no form of microcytic anemia in the birds since the MCV value at anincreased value. Increased numbers of lymphocytes, monocytes, eosinophils, and neutrophil were obtained when compared with the reference value indicated by Merck Veterinary Manual (2011).

CONCLUSION

The degree of anemia is determined by Hbc, PCV, and RBCs count, while the characterization of anemiais aided by calculated red cell indices (i.e., MCV, MCH, and MCHC). In the result shown, the PCV and RBC's count shows stability down the treatments while Hbc and other hematocrit parameter (MCV, MCH, and MCHC) decreased significantly. The low MCHC maybe as result of the iron deficiency in the diets**.** The total protein, albumin, and ALT are average compared to the standard value.

RECOMMENDATION

Considering the hematological parameter in this experiment, it is discovered that the PCV of the birds in the treatments are normal therefore the three medicinal plants extract can be used to improve the blood level and serum biochemical parameter of the bird, although further research can be done the three medical plants to examined the potentials and inhibitory characteristics.

REFERENCES

Abeloff,(2008) Abeloff's Clinical Oncology, Philadelphia, PA:Churchill Livingstone, An Imprint of Elsevier.4th edition: pp2592.

Adebolu, T. T.,&Salau, A. O., (2005) Antimicrobial activity of leaf extracts of *Ocimum gratissimum* on selected diarrhea-causing bacteria insouthwestern Nigeria *Afr J Biotech*. 4: 682-4

Altman P. L, &Dittmer D. S., (1974) Blood, and other body fluid, Washington D. C., Fed of Ani.Society for Exptl Biol. Augusti, K.T. (1996). Therapeutic values of onion (*Allium cepa* L.) and garlic (*AlliumSativa L.*) *Ind. J. Exo. Biol.*, 34:634-640.

Dacie, J.V.,& Lewis, S.M., (1995) Practical Haematology. Churchill Livingstone, Edinburg, London, 7 Edition: 12-17

Dainty C., (2004) Haematology in clinical practice; course handbook and guidelines for undergraduates 1: 3-5

Damery, S., Gratus, C., &Grieve, R., (2011). The use of herbal medicines by people with cancer: a cross-sectional survey; 104(6):927-33.

Gratus, C., Wilson, S., Greenfield, S. M., Damery, S. L., Warmington, S. A., Grieve, R., Steven, N. M., &Routledge, P., (2009). The use of herbal medicines by people with cancer: a qualitative study. Complement Altern Med. 9:14

Heinrich, Chan M. J., Wanke, S., Neinhuis, C. H.,& Simmonds, M.S.S., (2009) Local Uses of Aristolochia species and content of Aristolochic Acid 1 and 2 – a global assessment based on bibliographic sources. *Journal of Ethnopharmacology* 125: 108 – 144.

Harris T., Eagle (1935). The immunological Specificity of the Euglobin and Pseudoglobulin fraction of Horse and Human Serum (2): 383-396

Irizarry-Rovira, A.R. (2004). Avianand reptilian clinical pathology (Avian hematology & biochemical analysis), Section XI, pp.282–313.

Islam, M. W, Rahman, M.M., Kabir, S.M.L., Kamruzzaman, S.M.,& Islam, M.N.,(2004). Effect of probiotics supplementation on growth performance and specific parameter in broiler chicken. *Bangladesh Journal of Veterinary Medicine* 2: 39- 43

Kabir, O. A., Olukayode, O., Chidi, E. O., Christopher, C. I., &Kehinde, A. F., (2005) Screening of crude extracts of six medicinal plants used in South West Nigerian unorthodox medicine for anti-methicillin resistant *Staphylococcus aureus* activity. BMC Complement Altern. Med; 5: 1-7.

Nakagawa, S., Masammoto, K. Sumiyoshi, H., Kunihiro, K.,& Fuwa,T., (1980). Effect of raw and extracted aged garlic on the growth of young rats and their organ after preoral

administration, *J. Toxicol. Sci*., 5:91-112.

Macaulay, I. C., Tijssen, M. R., &Thijssen-Timmer D. C., (2007)Comparative gene expression profiling of in vitro differentiated megakaryocytes and erythroblasts identify novel activatoryand inhibitory platelet membrane proteins. Blood 109:3260-3269.

Madubuike. F. N., &Ekenyem, B. U., (2006) Haematology and Serum Biochemistry Characteristics of Broiler Chicks fed varying dietary levels of *ipomeaasarifolia*leaf meal. 5 (1): 09-12

Merck Veterinary Manual (2011). Hematological and serum biochemical reference guides, 10th ed. online version.

Samadieh B., Bankowski, R.A., &Carrol, E.J., (1969): Electrophoretic analysis of serum proteins of chicken experimentally infected with Marek's disease agent. *Amer J Vet Res* 30: 837

Schermer S. (1967). The blood Morphology of Laboratory Animal, Philadephia, F, A Davis Co.

Soranzo N, Rendon, A, Gieger C, (2009). A novel variant on chromosome associated with mean platelet volume, counts, and function. Blood; 113:3831-3837.

Spector W.S., (1961).Handbook of Biological Data. Philadephia, Saunders W. B co.

Vanherweghem, J. L., Depierreux, M, Tielemans, C., Abramowicz, D., Dratwa, M., Jadoul, M., Richard,C., Vandervelde, D., Verbeelen, D., & Vanhaelen-Fastre,R., (1993)."Rapidly progressive interstitial renal fibrosis in young women: association with slimming regimen including Chinese herbs". The Lancet 341 (8842): 387–391

Wakenell, P.S. (2010). Hematology of chickens and turkeys. Chapter 122, pp. 957–967.

Wang, C.S, Chang, Ting-Tsung, Yao, Wei-Jen Wang, Shan-Tair & Chou, Pesus (2012). Impact of increasing alanine aminotransferase levels within the normal range of incident diabetes. (4): 201-8

Zen K, Liu Y, &McCall I. C, (2005). Neutrophil migration across tight junctions is mediatedby adhesive interactions between epithelial coxsackie and adenovirus receptor and junctions by anadhesive molecule-like protein on neutrophils 16:2694- 2703.

Zola H, Swart B, &Nicholson I,(2005) Human cell differentiation molecules. Blood 106:3123-3126.