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Dietary Supplementation of Rauvolfia Vomitoria Root extract as a Phytogenic Feed additive in Growing Rabbit diets: Haematology and Serum Biochemical Indices

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Abstract: *The objective of the present study was to determine effect of dietary supplementation of Rauvolfia vomitoria root extract (RVME) as a phytogenic feed additive in growing rabbit diets: haematology and serum biochemical indices. Thirty (30) weaned rabbits of mixed breed and sex between 6-7 weeks with an average weight of 530.9 and 533.0 grams were divided into five treatments with three replicates per treatment consisting of 2 rabbits per replicate in a completely randomized design. Rabbits in treatment 1 (T1) were fed basal diet with 0 % RVME while T2, T3, T4 and T5 were given RVME at 20 ml, 40ml, 60 ml, and 80 ml/litre of water respectively. The experiment lasted for 12 weeks; food and water were provided ad libitum and all other management were strictly observed. Data collected were used to evaluate the some haematological and serum biochemical indices of animals. Haematological parameters covered pack cell volume (PCV), haemoglobin (Hb), red blood cell (RBC), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), white blood cell (WBC) and its differentials while serum analysis contained total protein (Tp), globulin, albumin, creatinine, urea, calcium, phosphorus, sodium, chloride, aspartate serum aminotransferase (AST), alanine amino transferase (ALT) and alanine phosphatase (ALP). All the haematological parameters were significantly (P <0.05) different among the treatment. Creatinine, urea and chloride ions not influenced by the dietary treatments (P > 0.05) while the other serum biochemical parameters were significantly (P <0.05) affected by RVME. Increasing the level of RVME from 20 ml to 80 ml tended to reduce ALP, AST and ALT values. It was concluded that feeding rabbits RVME at 80 ml/ liter did not cause any negative effect on the health of the animals; the data revealed that all values were within the physiological reference range for rabbits.*

Key words: *Rabbits, Rauvolfia vomitoria root, performance, haematology, serum*

Introduction

The indiscriminate use of antibiotics in livestock production has led to antimicrobial resistance, multiple drug resistance and harmful residual toxicity in livestock products. This has prompted a new research into developing safer and more natural feed additives, thus improving productivity, strengthening the immune system, reducing mortality and other ailments in human and animals (Alagbe, 2020; Oetting, 2005). Plants and their extracts are being used in animal nutrition as appetizers, digestive and physiological stimulants and antioxidants for the prevention and treatment of certain pathological conditions due to the presence of phytochemicals in them (Dalle et al., 2016). The use of plant extracts is more suitable for rabbits and human health care with the benefits of low cost, effectiveness and total safety (Oluwafemi

et al., 2020; Olafadehan et al., 2020). Phytochemicals can be classified by their therapeutic values (anti-inflammatory, antifungal, antiviral, hypolipidemic, antioxidants, anticancer etc.) and preparation modes (syrup, decoction, tincture, infusion, maceration and inhalation) (Dalle et al., 2016; Olafadehan et al., 2020; Agostini et al., 2012; Shah et al., 2014).

Plant extracts which is reported to have immunomodulatory and physiological activity includes: Allium sativum (garlic), Rosmarinum officinalis (rosemary), Piliostigma thonningii, Daniellia oliveri, Curcuma longa, Syzygium aromaticum (clove), Thymus vulgaris (thyme), Curcuma longa (turmeric), Origanum vulgare (oregano), Moringa olifera, Azadirachta indica, Indigofera zollinginfera and most recently Rauvolfia vomitoria root (Martins et al., 2000; Barreto et al., 2007; Alamer and Basiouni, 2005; Shittu and Alagbe, 2020; Abd-El-Hady, 2014; Akintayo and Alagbe, 2020; Alcicek et al., 2003, 2004; Al-Turki, 2007; Barug et al., 2006; Omer et al., 2012; Placha et al., 2013).

Rauvolfia vomitoria belong to the family Apocynaceae and it is widely distributed in Asia (China, Japan, Pakistan, Korea and India) and tropical Africa (widespread from Senegal through Cameroon, Central African Republic, Sudan to Uganda, south to Angola, DR Congo and Tanzania) (Ibironke and Olusola, 2013). It can grow to about 8 m (26 ft) high and the tree branches grow in whorls, and the leaves grow from swollen nodes in groups of three. The leaf blades are broadly lanceolate or elliptical, tapering to a long point. The small, fragrant flowers are followed by globular red fruit. All parts of the plant, except the mature wood, contain latex (Neffati et al., 2017). Traditionally, the leaves and stem bark are used for the treatment of convulsions, fever, weakness, inability to sleep, mental disorders, pain, arthritis, cancer, high blood pressure, diabetes, and health of the stomach, intestines, and liver (Olajumoke et al., 2012). Rauvolfia vomitoria is widely used in traditional medicine in Africa and has also become a major source of a number of compounds used in the pharmaceutical industry, particularly reserpine, reserpinine, deserpidine, ajmalicine and ajmaline. It contains in total between 40 - 80 different indole alkaloids, most of which occur in very small amounts and several are disputed. Most alkaloids occur in an unstable complex, and seasonal variation is present as well. The leaves contain 0.03 - 0.8% total alkaloids; the stem bark about 0.6%; the roots 0.15 - 0.2%; and the root bark from 1.5 - 2% (Akeem, 2019). According to Alagbe (2021), proximate composition of Rauvolfia vomitoria root revealed the presence of crude protein (10.04 %), crude fibre (17.11 %), ether extract (1.33 %), ash (14.57 %) and carbohydrates (51.33 g/100g). Vitamins contained β-carotene (1.73 mg/100g), B1 (18.11 mg/100g), B2 (0.33 mg/100g), B3 (0.25 mg/100g), B12 (0.30 mg/100g), C (41.03 mg/100g), D (0.10 mg/100g), E (0.41 mg/100g) and K (0.12 mg/100g) respectively.

Nutrients are known to influence the responses of rabbits to a disease challenge; a timely evaluation of the blood provides an opportunity to examine the physiological, nutritional and pathological status of an animal. Therefore, this study was carried out to determine the effect of dietary supplementation of Rauvolfia vomitoria root extract as a phytogenic feed additive in growing rabbit diets: haematology and serum biochemical indices.

MATERIALS AND METHODS

Study Area

The experiment was carried out at Division of Animal Nutrition, Sumitra Research Institute, Gujarat, India during the month of April to June, 2020.

Collection and Identification of Rauvolfia vomitoria root extract (RVME)

Fresh roots from mature Rauvolfia vomitoria tree were harvested from different plants within Sumitra Research Institute Gujarat, India and authenticated by a certified crop taxonomist (Dr. Maureen Sharma).

Preparation of Rauvolfia vomitoria root extracts (RVME)

The roots thoroughly washed with running tap water to remove dirt and later cut into bits and allowed to dry under shade for 10 days to retain the bioactive chemicals in the sample. The dried samples was blended into fine powder using mortar and pestle and stored in a well labeled air tight container for further analysis. Rauvolfia vomitoria extract was prepared by soaking 200 g of the sample in 1000 liters of water in the refrigerator at 4oC for 48 hours. The mixture was filtered using WhatMan No 1 filter paper to obtain the filtrate Rauvolfia vomitoria root extract (RVME).

Animal and their management

Thirty (30) weaned rabbits of mixed breed and sex between 6-7 weeks with an average weight of 530.9 and 533.0 grams were used for the experiment; they were sourced from an open market in India. The animals were housed in an all wired cage measuring (15 × 12 × 25 cm) and equipped with feeders and drinkers. Prior to the commencement of the experiment, pen and cages were properly disinfected and all other biosecurity measures were strictly observed. They were divided into five treatments with three replicates per treatment of 2 rabbits per replicate in a completely randomized design. Rabbits were allowed two weeks adjustment period during which they were fed with basal diet (morning and evening) and given prophylactic treatment with Oxytetracycline administered intramuscularly and Ivermectin given subcutaneously adhering strictly to the package insert. Animals were fed twice daily between 7:30 am and 3:30 pm. Fresh feed and water were provided ad libitum and all other management practices were strictly observed throughout the experiment which lasted for 84 days.

Diet formulation

The basal diet was formulated to meet the nutrient requirements of growing rabbits according to NRC (1977).

Treatment 1: Basal diet + 0 % RVME
Treatment 2: Basal diet + 20 ml/litre RVME
Treatment 3: Basal diet + 40 ml/litre RVME
Treatment 4: Basal diet + 60 ml/litre RVME
Treatment 5: Basal diet + 80 ml/litre RVME

Data measured

Feed intake (g) was determined by subtracting feed left over from feed served, it was estimated for each of the replicate daily.

Blood analysis

At the end of the experiment blood samples were collected very early in the morning (8:00 Am) from three (3) randomly selected rabbit per replicate for heamatological and serum analysis, the animals were not stressed to prevent oxygenated blood from becoming deoxygenated. About 5 ml of the sample was emptied into a labeled ethylene diamine tetraacetate (EDTA) bottle for haematological analysis. Pack cell volume (PCV), haemoglobin (Hb), red blood cell (RBC), white blood cell (WBC) and its differentials (lymphocytes, neutrophils and eosinophils) were determined

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according to the methods outlined by Coles (1986). Mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) were calculated as:

MCV (fl) = PCV × 10 / RBC mm/3

MCH (pg) = Hb in g/100 ml blood × 10 / RBC mm/3

MCHC (%) = Hb in g/100 ml blood × 10 / PCV

Blood sample for serum biochemistry were collected into bottles without EDTA. Total protein, albumin, globulin, glucose, creatinine, urea, sodium, chloride, aspartate serum aminotransferase (AST), alanine amino transferase (ALT) and alanine phosphatase (ALP) were determined using commercial test kits (GST- 4509 A model, Punjab, India).

Chemical analysis

Proximate analysis of experimental diet was carried out according to methods outlined by AOAC (1990). Amino acid analysis was carried out using methods reported by Kundan (2017).

Statistical analysis

All data were subjected to one -way analysis of variance (ANOVA) using SPSS (23.0) and significant means were separated using Duncan multiple range tests (Duncan, 1955). Significant was declared if $P \leq 0.05$.

Table 1: Percentage composition of experimental diet

Ingredients	Quantity (Kg)
Maize	29.40
Wheat offal	55.00
Palm kernel meal	4.25
Soya bean meal	10.00
Bone meal	0.40
Limestone	0.20
Lysine	0.10
Methionine	0.10
*Growers Premix	0.25
Salt	0.30
Total	100.00
Calculated analysis (%)	
Crude protein	17.08
Crude fibre	9.87
Ether extract	3.52
Calcium	0.61
Phosphorus	0.33
Ca :P ratio	1.50
Lysine	0.82
Meth + Cystiene	0.66
ME: kcal/kg	2500.1

*Premix supplied per kg diet :- Vit A, 7,000 I.U; Vit E, 5mg; Vit D3, 3000I.U, Vit K, 3mg; Vit B2, 5.5mg; Niacin, 25mg ; Vit B12, 16mg ; Choline chloride, 120mg ; Mn, 5.2mg ; Zn, 25mg ; Cu, 2.6g ; Folic acid, 2mg ; Fe, 5g ; Pantothenic acid, 10mg ; Biotin, 30.5g ; Antioxidant, 56mg

Table 2: Amino acid composition of Rauvolfia vomitoria root

Constituents	Composition (%)
Glutamic acid	1.53
Aspartic acid	1.18
Glycine	0.41
Serine	1.28
Alanine	9.72
Histidine	1.01
Lysine	0.06
Methionine	0.02
Tyrosine	2.04
Leucine	3.11
Isoleucine	1.38
Threnonine	0.02
Phenylalanine	0.36
Arginine	10.13
Proline	1.18
Valine	2.50

Table 3: Haematological parameters of growing rabbits fed Rauvolfia vomitoria root extracts

Parameters						

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	T1	T2	T3	T4	T5	SEM
PCV (%)	30.28^{c}	36.92^{b}	39.11^{a}	40.93^{a}	47.02^{a}	1.94
Hb (g/dL)	9.11^{c}	10.28^{b}	11.03^{b}	12.64^{a}	13.39^{a}	0.61
RBC ($\times10^{6}$/mm^{3})	2.94^{c}	3.02^{b}	3.85^{b}	4.03^{a}	5.21^{a}	0.03
MCV(fl)	43.40^{c}	50.18^{b}	59.40^{b}	61.28^{a}	65.33^{a}	1.80
MCH (pg)	18.22^{c}	21.10^{b}	23.81^{b}	24.04^{b}	27.10^{a}	0.03
MCHC (%)	27.18^{c}	30.01^{b}	31.72^{b}	35.22^{a}	35.71^{a}	0.01
WBC($\times10^{3}$/mm^{3})	7.83^{b}	8.25^{b}	9.73^{b}	10.06^{a}	12.55^{a}	0.05
Differentials (%)						
Lymphocytes	47.92^{c}	51.40^{b}	59.40^{b}	62.04^{a}	65.27^{a}	2.06
Monocytes	0.41^{b}	0.97^{b}	1.03^{a}	1.21^{a}	1.34^{a}	0.04
Eosinophils	0.28^{c}	0.56^{b}	0.72^{a}	0.83^{a}	0.91^{a}	0.01

Means in the same row with different superscript are significantly different (P<0.05)
Mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC), white blood cell (WBC), Haemoglobin (Hb) and Pack cell volume (PCV).

Table 4: Serum biochemical indices of growing rabbits fed Rauvolfia vomitoria root extracts

Parameters	T1	T2	T3	T4	T5	SEM
Total protein (g/dl)	5.33^{c}	6.28^{b}	6.73^{b}	7.01^{a}	7.10^{a}	0.24
Albumin (g/dl)	3.00^{b}	3.10^{b}	3.40^{a}	3.71^{a}	3.70^{a}	0.03
Globulin (g/dl)	2.33^{b}	3.18^{a}	3.33^{a}	3.30^{a}	3.40^{a}	0.01
Creatinine (mmol/L)	0.10	0.13	0.15	0.17	0.18	0.01
Urea (mmol/L)	0.04	0.02	0.03	0.04	0.05	0.02
Ca (mmol/L)	2.62^{b}	2.88^{b}	3.03^{a}	3.56^{a}	3.94^{a}	0.10
P (mmol/L)	0.98^{b}	1.33^{a}	1.41^{a}	1.51^{a}	1.78^{a}	0.12
Na (mmol/L)	126.2^{c}	130.3^{b}	140.1^{a}	142.8^{a}	143.1^{a}	3.08
Cl (mmol/L)	100.2	103.3	108.4	110.2	115.6	5.02
ALP (U/L)	23.11^{a}	19.70^{a}	17.65^{a}	15.56^{b}	14.05^{b}	1.71
AST (U/L)	15.56^{a}	10.22^{a}	9.44^{b}	9.03^{b}	8.94^{c}	0.08
ALT (U/L)	10.96^{a}	9.33^{b}	9.03^{b}	7.93^{c}	7.62^{c}	0.02

Means in the same row with different superscript are significantly different (P<0.05)
Ca: calcium, P; phosphorus, Na: sodium, Cl: chloride, AST: aspartate serum aminotransferase, ALT: alanine amino transferase, ALP: alanine phosphatase

RESULTS AND DISCUSSION

The percentage composition of experimental diet and amino acid analysis of Rauvolfia vomitoria root is presented in Table 1 and 2 respectively. The feed was formulated to meet the nutritional requirement of rabbits according to NRC (1977). Inadequate energy, protein or micronutrients in the diet may impair performance of rabbits (Niyi, 1997). According to Aduku and Olukosi (1990), rations for dry does, bucks and growing rabbits should contain 12-17 % protein. Energy requirement for rabbits at the growing phase is within 2600-2700 kcal/kg metabolizable energy (Fielding 1991). Fibre is also an important nutrient component which rabbits require in their ration

for efficient digestion, prevention of coronary heart diseases and reduction in serum cholesterol level (Alagbe et al., 2020; Fasola et al., 2011; Alagbe, 2021). Rabbits require a level of crude fibre in excess of 9% for normal growth and to reduce incidence of enteritis and diarrhoea. Low fibre level of below 10% leads to hypomotility which predisposes the animal to diarrhoea (Champ and Maurice, 1983; Alagbe and Oluwafemi, 2019; Musa et al., 2020; Alagbe, 2017). Fats are essential in diets for energy, they increase the palatability of feeds by absorbing and retaining their flavours (Alagbe and Motunrade, 2019; Onuegbu and Iwu, 2020). Rabbits have the ability to withstand high levels of calcium in their diet without adverse effects (Gillespie 1992, 1998; Ajayi and Raji, 2012; Alagbe, 2019). Levels of phosphorus greater than 1% of the diet reduces palatability of the ration and may lower feed intake.

The amino acid components of Rauvolfia vomitoria root revealed the presence of glutamic acid (1.53 %), aspartic acid (1.18 %), glycine (0.41 %), serine (1.28 %), alanine (9.72 %), histidine (1.01 %), lysine (0.06 %), methionine (0.02 %), tyrosine (2.04 %), leucine (3.11 %), isoleucine (1.38 %), threonine (0.02 %), phenyl alanine (0.36 %), arginine (10.13 %), proline (1.18 %) and valine (2.50 %) respectively. Amino acids are vital in the synthesis of proteins, precursors in the formation of secondary metabolism molecules, synthesis of hormone, physiological processes, gene expression and homeostatis regulation (Dioguardi, 2011; Nicastro et al., 2011). The amino acid of profile of Rauvolfia vomitoria root is similar to the values reported by Kundan (2017) who evaluated the amino acid and antioxidant composition of Pavetta indica. Inadequate amount of tyrosine could lead to a deficiency of nor-epinephrine in the brain which causes depression (Elango et al., 2009). Arginine has an effect on protein synthesis, hormone secretion, neurotransmission, growth vasodilation and antioxidant activities (Cuin and Shabala, 2007). Alanine and glutamic acid are vital for healthy nervous and cardiovascular system (Pèrez et al., 2009). Cysteine is used for protein synthesis, co-enzyme A synthesis and glutathione (Wu, 2009; Vanisree et al., 2004). Glycine is necessary for central nervous system and healthy prostrate (Muhammed et al., 2017). Lysine, glutamic acid and threonine are vital in the maintenance of the intestinal integrity of an animal, thus influencing retention time of feed in animals (Rhoads et al., 2009; Wang and Qiao, 2009; Vivanco et al., 2005). Valine, serine, proline, lysine and methionine are maintains the balance of branched chain amino acids, transfer of methyl groups within the body, synthesis of collagen, cell division and oxidative damage (Wu, 2009; Akram et al., 2011; Vazquez – Ortiz et al., 1995). Phenylalanine is necessary for glucose secretion and fat oxidation (Ramamoorthy et al., 2011; Prasad and Bisht, 2003; Alagbe, 2020).

The haematological characteristics of growing rabbits fed different levels of Rauvolfia vomitoria root is presented in Table 3. Pack cell volume (PCV), haemoglobin (Hb), red blood cell (RBC), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) values ranged between 30.28 – 40.93 %, 9.11 – 12.64 g/dL, 2.94 – 5.21(×106/mm3), 43.40 – 61.28 fl, 18.22 – 24.04 pg and 27.18 – 35.22 % respectively. The parameters follow similar trend as the values were highest in T4 and T5, intermediate in T2, T3 and lowest in T1 ($P< 0.05$). White blood cell (WBC), lymphocytes,

monocytes and eosinophils ranged between 7.83 – 12.55 (×103/mm3), 47.92 – 62.04 %, 0.41 – 1.21 % and 0.28 – 0.83 % respectively. All the parameters were significantly different (P< 0.05) among the treatments. PCV are responsible for the transportation of oxygen and absorbed nutrients in the body of animals (Isaac et al., 2013), thus a higher PCV values in birds fed T4 and T5 is an indication of a better nutritional status. Packed Cell Volume, haemoglobin and mean corpuscular haemoglobin are major indices for evaluating circulatory erythrocytes, and are significant in the diagnosis of anaemia and also serve as useful indices of the bone marrow capacity to produce red blood cells as in mammals (Chineke et al., 2006). Haemoglobin has the physiological function of transporting oxygen to tissues of the animal for oxidation of ingested food so as to release energy for the other body functions as well as transport carbon dioxide out of the body of animals (Soetan et al., 2013). According to Isaac et al. (2013) red blood cell is involved in the transport of oxygen and carbon dioxide in the body. Thus, a reduced red blood cell count implies a reduction in the level of oxygen that would be carried to the tissues as well as the level of carbon dioxide returned to the lungs (Ugwuene, 2011; Isaac et al, 2013). Mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration indicate blood level conditions. A low level is an indication of anaemia (Aster, 2004). Mitruka and Rawnsley (1977) reported the normal range of value for rabbits as follows: PCV: 30 – 35%, Hb: 9.3 – 19.3g/dl and RBC: 4.00 – 8.60 (x106mm3). Postgraduate Committee in Veterinary Sciences [PCVS] (1990); Merck manual (2012) stated a standard WBC range of values of 2.5 – 12.5 (x103mm3). White blood cell (WBC) and its differentials are responsible for the production of antibodies and strengthening the immune system of animals (Alagbe, 2017, Alagbe et al., 2018; Schalm et al., 1975). High WBC is an indication that animals in T4 and T5 have a high degree to resist diseases. However, all the values were within the normal physiologic range for rabbits reported by Research Animal Resources [RAR] (2009); Burke (1994).

Serum biochemical indices of growing rabbits fed different levels of Rauvolfia vomitoria root is presented in Table 4. Total protein, albumin, globulin, creatinine, urea, calcium, phosphorus, sodium, chloride ranged between 5.33 – 7.10 (g/dl), 3.00 – 3.71 (g/dl), 2.33 – 3.40 (g/dl), 0.10 -0.18 (mmol/L), 0.02 – 0.04 (mmol/L), 2.62 – 3.56 (mmol/L), 0.98 – 1.51 (mmol/L), 126.2 – 142.8 (mmol/L) and 100.2 – 110.2 (mmol/L) respectively. Total protein, albumin, globulin, calcium, phosphorus and sodium were significantly (P< 0.05) influenced by Rauvolfia vomitoria root extract (RVME). Creatinine, chloride and urea values were not significantly different among the treatments (P > 0.05). Aspartate serum aminotransferase (AST), alanine amino transferase (ALT) and alanine phosphatase (ALP) ranged between 9.03 – 15.56 (UL), 7.62 – 10.96 (UL) and 15.56 – 23.11 (U/L). ALT, AST and ALP values were highest in T1 and T2, intermediate in T3, T4 and lowest in T5 (P< 0.05). High values in the serum total protein in T4 and T5 is an indication that the diets are safe and it contains adequate nutrients necessary for the growth of the animals (Gboshe et al., 2020; Omokore and Alagbe, 2019). According to Altman et al. (1979), total albumin that is less than the normal physiological values usually indicate hypoalbuminemia which may result from deficient intake of protein, deficient synthesis of albumin, excess protein

breakdown, chronic liver diseases or starvation and chronic gastro intestinal diseases with their interference with protein digestion and absorption. Saad et al. (2017); Henry et al. (2017); Ozkan et al. (2012) reported the normal range of value for rabbits as follows: total protein (2.42 – 9.45 g/dl), albumin (2.01 – 3.81 g/dl), globulin (1.50 – 2.95 g/dl), calcium (2.55 – 4.43 mmol/L), phosphorus (1.07 – 1.85 mmol/L), sodium (132.56 – 149.81 mmol/L), chloride (101.43 – 118.37 mmol/L), creatinine (0.01 – 0.15 mmol/L), AST (7.34 – 17.52 U/L), ALT (4.69 – 9.93 U/L) and ALP (12.63 – 24.89 U/L). Normal creatinine and urea values in rabbits are clear signs that the integrity of the kidney and liver are not compromised (Alagbe et al., 2020). This result is in agreement with the findings of Ajayi and Raji (2012) who examined the haematological and serum biochemical indices of pre pubertal male rabbits fed graded level of blood wild sunflower forage meal mixture. Calcium, phosphorus, sodium and chloride ion levels obtained in this experiment were within the reference range for rabbits reported by Melillo et al. (2007); Silva et al. (2005). Excessive sodium and chloride ion in the blood could damage the kidney and other internal organs. AST, ALT and ALP values follow similar pattern, the values increased significantly ($P< 0.05$) as the level of Rauvolfia vomitoria root extract increases. This signifies that the animals were able to tolerate the levels of antinutrients in RVME. According to Alagbe (2021), Rauvolfia vomitoria root is a medicinal plant which contains several bioactive chemicals or phytochemicals that performs multiple biological functions in animals. They are also huge reservoir for various chemical substances with potential therapeutic properties and are being increasing utilized to treat wide variety of clinical diseases (Gupta et al., 2004).

Conclusion

Rauvolfia vomitoria root extract is loaded with phytochemicals and it exerts several pharmacological properties like anti-inflammatory, antioxidants, hepatoprotective, antihyperglycaemic, antifungal, antiviral, hypolipidaemic, cytotoxic etc. They are relatively cheap, safe, and effective and could be used to bridge the gap between food safety and production. Feeding rabbits Rauvolfia vomitoria root extract at 80 ml/liter had no deleterious effect on the blood profile of animals.

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