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Comparative Effect of *Rauvolfia vomitoria* and *Andrographis paniculata* on Lipid Profile and Selected Organs of Wistar Rats.

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Abstract

The Use of medicinal plants in treatment of illnesses is as old as mankind itself. The study was carried out to determine and compare effects of aqueous leave extracts of Rauvolfia vomitoria and Andrographis paniculata on blood lipid profile and therapeutic safety on vital organs of Wistar rats. The Rats were grouped and administered extract at 200mg/kg of both plant extract along with atherogenic diet for 14 days after which their body weight and blood were collected for analysis. The results shows that there was no significant difference in the body weight gain of the Rats and Organ weights across all groups. Total Cholesterol (TC), Triacylglyceride and High-Density Lipoprotein (HDL) were determined while Low Density Lipoprotein (LDL) was calculated using a microtech 3000 colorimeter. The results showed that there was no significant difference in the body weight of the Rats and the Organ weights across all groups. From this study both plants had a positive effect on lipid profile though Andrographis paniculata appears to produce more significant difference in its effect relative to Rauvolfia vomitoria. Therefore, their potential for use as a prevention of atherosclerosis and hypertension is very much indicated.

Keywords: Plant Extract*, Andrographis paniculata, Rauvolfia vomitoria,* lipid profile.

Effet comparatif de *Rauvolfia vomitoria* et *Andrographis paniculata* sur le profil lipidique et certains organes de rats Wistar.

Résumé

L'utilisation des plantes médicinales dans le traitement des maladies est aussi ancienne que l'humanité elle-même. Cette étude a été menée pour déterminer et comparer les effets des extraits aqueux de feuilles de Rauvolfia vomitoria et d'Andrographis paniculata sur le profil lipidique sanguin et leur innocuité thérapeutique sur les organes vitaux de rats Wistar. Les rats ont été répartis en groupes et ont reçu des extraits à 200 mg/kg des deux plantes, ainsi qu'un régime athérogène pendant 14 jours, après quoi leur poids corporel et leur sang ont été prélevés pour analyse. Les résultats montrent qu'il n'y a pas eu de différence significative dans la prise de poids corporel des rats ni dans le poids des organes entre tous les groupes. Le cholestérol total (CT), les triacylglycérides et les lipoprotéines de haute densité (HDL) ont été dosés, tandis que les lipoprotéines de basse densité (LDL) ont été calculées à l'aide d'un colorimètre Microtech 3000. Les résultats ont révélé qu'il n'y avait pas de différence significative dans le poids corporel des rats ni dans le poids des organes entre les groupes. Cette étude montre que les deux plantes ont eu un effet positif sur le profil lipidique, bien qu'Andrographis paniculata semble produire une différence plus significative dans ses effets par rapport à Rauvolfia vomitoria. Ainsi, leur potentiel d'utilisation dans la prévention de l'athérosclérose et de l'hypertension est fortement suggéré.

Mots-clés : Extrait végétal, *Andrographis paniculata, Rauvolfia vomitoria*, profil lipidique.

٥. التأثير المقارن لنباتي رافولفيا فوميتوريا وأندروغرافيس بانيكولاتا على نسبة الدهون في الدم وبعض الأعضاء المختارة لفئران ويستار.

Comparative Effect of *Rauvolfia vomitoria* and *Andrographis paniculata* on Lipid Profile and Selected Organs of Wistar Rats.

إن استخدام النباتات الطبية في علاج الأمراض قديم قِدم البشرية نفسها. وقد أُجريت هذه الدراسة لتحديد ومقارنة تأثير مستخلصات أوراق نباتي رافولفيا فوميتوريا وأندروغرافيس بانيكولاتا المائية على نسبة الدهون في الدم وسلامة الأعضاء الحيوية علاجيًا لدى فئران ويستار. تم تقسيم الفئران إلى مجموعات وأُعطيت المستخلصات بجرعة 200 ملغم/كغم من كل من النباتين، إلى جانب نظام غذائي مسبب لتصلب الشرايين لمدة 14 يومًا، وبعدها تم قياس أوزان أجسامها وأُخذت عينات دم للتحليل.

أظهرت النتائج أنه لم يكن هناك فرق معنوي في زيادة وزن الجسم أو في أوزان الأعضاء بين جميع المجموعات. تم تحديد نسبة الكوليسترول الكلي(TC) ، والدهون الثلاثية(Triacylglyceride) ، والبروتينات الدهنية عالية الكثافة(HDL) ، في حين تم حساب البروتينات الدهنية منخفضة الكثافة (LDL) باستخدام جهاز قياس الألوان .Microtech 3000 وقد بيّنت النتائج عدم وجود فروق معنوية في وزن الجسم أو أوزان الأعضاء بين المجموعات.

ومن خلال هذه الدراسة، تبيّن أن كلا النباتين كان لهما تأثير إيجابي على نسبة الدهون في الدم، إلا أن أندروغرافيس بانيكولاتا أظهر تأثيرًا أكثر وضوحًا مقارنةً برافولفيا فوميتوريا. وبالتالي، فإن لهذين النباتين إمكانية واضحة في الوقاية من تصلب الشرايين وارتفاع ضغط الدم.

الكلمات المفتاحية: مستخلص النبات، أندروغرافيس بانيكولاتا، رافولفيا فوميتوريا، نسبة الدهون في الدم.

Introduction

The prevalence of dyslipidemia, characterized by abnormal lipid levels in the blood, is a major risk factor for cardiovascular diseases. Medicinal Plants have been used since time immemorial in virtually all societies as sources of medicines to combat various ailments including infectious diseases. (Alli *et al* 2010) It is also a potential source of cheap starting products for the synthesis of new drugs such as reserpine from *Rauvolfia* species. (Sofowora, 2008) World Health Organization in (2002) reported that over 85% of the population in Sub-Sahara Africa including Nigeria depends on herbal traditional medicine for their health care needs. They emphasized the importance of scientific investigations into herbal medicines. Traditional medicinal plants have been explored for their potential to manage lipid profiles and improve cardiovascular health. *Rauvolfia vomitoria* and *Andrographis paniculata* are two such plants with documented medicinal properties.

Andrographis paniculata (Nees) belongs to the natural order Acanthaceae. It is commonly known as king of bitters. *Andrographis paniculata* is found in India subcontinent and southeast Asia as an erect perennial shrub and different parts of it are used for the treatment of various diseases such as fever, infections and inflammatory conditions. Some use it in the treatment of dysentery, snake and insect bites, cuts, boils etc. It is also reported to possess antihypertensive, anticancer, anti-inflammatory and immunomodulatory effects (Kumar, et al., 2021). These properties could also influence lipid metabolism.

Rauvolfia vomitoria (Afzel) on the other hand which belongs to the family of Apocynaceae, is a shrub or small tree found naturally in the forest native of Nigeria, Cameroon, Congo, Ghana, Liberia, Senegal, Sudan and Uganda. *Rauvolfia vomitoria* Afzel, a shrubby tree was described in 1817 by Adams Afzelius. The specific epithet *vomitoria* refers to the purgative and emetic properties of the bark. In Ivory Coast, the serpent sect of the main region considers the plant fetish. The young twigs with the side branches trimmed short serve as mixers for drinks, hence, the English name, "swizzle stick". The yorubas call it *Asofeyeje*, the Igbos call it akanta while in Hausa it's called wadda. Kutalek and Prinz (2007) reported that *Rauvolfia vomitoria* plant is used as an emetic and purgative, cerebral cramps in children, jaundice, gastro intestinal diseases, psychiatric disorders. *Rauvolfia vomitoria* has been traditionally used for its antihypertensive and sedative effects, which might extend to modulating lipid levels.

Despite their traditional uses, there is limited comparative research on the effects of these

plants on lipid profiles. A thorough comparison is necessary to evaluate their relative efficacy and mechanisms of action in managing lipid abnormalities. This research aims to fill this gap by systematically comparing the impact of *Rauvolfia vomitoria* and *Andrographis paniculata* on lipid profiles, thereby providing insights into their potential therapeutic applications and guiding future research and clinical practices

Hypercholesterolemia or high cholesterol occurs when there is too much cholesterol in the body leading to various physiological disorders including coronary artery disease which has been reported as the most common cause of death across the world. (WHO,2014)(Yakozawa *et al*,2003). It leads to hardening of the arteries also called atherosclerosis in which the risk of developing it is directly related to the plasma LDL cholesterol and inversely related to the HDL cholesterol level. In atherosclerosis, the arterial wall contains accumulated cholesteryl esters in cells derived from the monocyte-macrophage line. There is also a smooth muscle cell proliferation and fibrosis which results to the narrowing of the blood vessels and leads to thrombus formation which precipitates myocardial infarction (Heart attack)

High cholesterol does not cause any symptom but it does cause damage deep within the body as it leads to a condition known as atherosclerosis which occurs when fat, cholesterol and substances build up in the walls of arteries forming hard structures called plaques. These plaques can block the arteries over time and narrowing the arteries for easy flow of blood making the heart to work harder than normal to pump blood causing high blood pressure and other heart diseases, stroke as well as other symptoms or problems throughout the body. Studies have shown that for every 1% reduction in cholesterol, there is a 2% reduction in the rate of heart disease. (Luther and Clark,1986).

Materials and method

Dosage Preparation

The dose was prepared by dissolving 2g of the aqueous extract in 1000m of water to give 200mg of the drug which was given daily to the rats for 14 days.

Animal and Diet

Young albino rats (*Rattus norvegicus*) weighing between 68 – 128 g of either sex was used for this study. They were sourced from the Department of Veterinary Medicine, Ahmadu Bello University, Zaria, Nigeria. The animals were housed in cages at room temperature in the experimental research laboratory of the Nigerian Defence Academy, Kaduna with a 12/12-hour light and dark cycle. The rats were fed with commercially produced grower's mash (Vital Feeds) as normal diet and water was provided *ad libitum*

Preparation of Atherogenic Diet

To 1000g of normal diet, 10g of cholesterol and 100 g of cooking and baking margarine was added. The fats and vital feed were properly mixed. The composition of the normal and high fat diet is as shown below:

Table 1: Animal Feed Composition

Nutrients	Normal Diet	High Fat Diet
Crude protein	15%	15%
Fat	7.0%	17%
Crude Fibre	10%	10%
Calcium	1.0%	1.0%
Phosphorus	0.35%	0.35%
Cholesterol	0.0%	1.0%

Experimental Procedure

After one week acclimatization period, the rats were randomly distributed into eight groups of four rats each and labelled A, B, C, D, E, F, G and H respectively. They received the following treatment for 14 days.

Group A (Negative Control) – Normal Diet, No treatment

Group B (positive Control) – Atherogenic Diet, No treatment
Group C – Normal Diet, 1.0m aqueous extract of *Andrographis paniculata*
Group D – Normal Diet, 1.0m aqueous extract of *Rauvolfia vomitoria*
Group E – Atherogenic Diet, 0.5m aqueous extract of *Andrographis paniculata*
Group F– Atherogenic Diet, 0.5m aqueous extract of *Rauvolfia vomitoria*
Group G – Artherogenic Diet, 1.0m aqueous extract of *Andrographis paniculata*
Group H – Artherogenic Diet, 1.0m aqueous extract of *Rauvolfia vomitoria*

At the end of the treatment, the rats were made to fast overnight but allowed water, and then sacrificed using slight chloroform as anesthesia. Blood samples were obtained into plain sample tubes via cardiac puncture. The blood was spun at 1000 rpm for 5 minutes using a centrifuge in order to obtain the serum which was later stored in a refrigerator for the purpose of subsequent analysis.

Their vital organs (liver, heart, kidney and lungs) were collected and observed using hand lens and weighed.

Determination of Body Weight

The body weights of the animals in each group were measured at initial (0 day) and final (14 day) days of trial by using balance and calculate percentage of body weight gain or loss with the following formular:

% body weight change = final weight – initial weight x 100
Initial weight

Lipid Analysis

The reagent manual provided the procedure for the determination of total cholesterol, triacylglyceride and high-density lipoprotein (HDL) while low density lipoprotein was calculated. A microtech, 3000 colorimeter was used.

Enzymatic– Colourimetric Method of Determining Total Cholesterol. Procedure: 1000ul of reagent was pipetted and mixed with 10ul of sample (serum). It was then incubated for 10 minutes in a water bath. The absorbance of sample was measured and recorded.

Determination of Triacylglyceride

100ul of reagent and 10ul of sample were pipetted into a tube and incubated in a water bath at 37^0c for 7 minutes. Its absorbance was read and recorded.

Determination of High-density Lipoprotein (HDL)

480ul of reagents 1 and 5ul of samples was pipette and mixed. It was then incubated for 5 minutes in a water bath after which reagent 2 was added and its absorbance taken.

Determination of Low-Density Lipoprotein (LDL)

The amount of LDL in the samples were calculated using the values of Total cholesterol, triacylglyceride and high-density lipoprotein

LDL = Total cholesterol – Triacylglyceride + High Density Lipoprotein

Results and discussion

Table 2: Percentage change in weight after Administration

Group	Before Administration	After Administration	% gain
A (CTND)	**96.2g**	**124.95g**	**30%**
B (CTFD)	**98.43g**	**135.45g**	**38%**

C (FDAP[1])	**89.23g**	**124.5g**	**40%**
D (FDRV[1])	**90.03g**	**109.08g**	**21%**
E (FDAP[2])	**91.0g**	**126.68g**	**39%**
F (FDRV[2])	**98.9g**	**119.25g**	**21%**
G (NDAP)	**97.03g**	**108.88g**	**12%**
H (NDRV)	**89.1g**	**123.0g**	**38%**

It was observed from the result of the weight of the Rats obtained before and after administration of the plant extracts that though all the rats across the test groups as well as the control groups had a good percentage weight gain between the period of treatment, some test groups (E, G, and D) had a slightly higher percentage weight gain compared to the control groups while others (F, H and C) had a lower percentage weight gain than the control groups. This may be linked to the fact that the individual feeding habit of rats in each group differ.

Table 3: Mean Organ weight of Rats after Administration of *Rauvolfia vomitoria* (Rv) and *Andrographis paniculata* (Ap) Leave extracts

Group	Liver	Heart	Lung	Kidney
A (CTND)	6.38g	0.53g	1.45g	1.20g
B (CTFD)	7.50g	0.68g	1.55g	1.38g
C (NDAP)	6.83g	0.65g	1.50g	1.33g
D (NDRV)	6.18g	0.63g	1.43g	1.18g
E (FDAP[2])	6.90g	0.75g	1.38g	1.30g
F (FDRV[2])	6.00g	0.65g	1.25g	1.00g
G (FDAP[1])	5.58g	0.58g	1.33g	1.05g
H (FDRV[1])	5.58g	0.68g	1.30g	1.05g

KEY: A- Negative Control, B- Positive Control, C-fatty Diet, 200mg/kg *Angdrographis paniculata*, D- Fatty Diet, 200mg/kg *Rauvolfia vomitoria*, E-400mg/kg *Angdrographis paniculata*, F- 400mg/kg *Rauvolfia vomitoria*, G- Normal Diet, 200mg/kg *Angdrographis paniculata*, H- Normal Diet, 200mg/kg *Rauvolfia vomitoria*

The weight of the liver was observed to be 5.58g for both NDAp and NDRv, i.e. lower than the negative control which had 6.38g. FDAp1 had an average

weight of 6.83g while HDRv1 had 6.18, both less than the positive control. Though, it could be observed that Rv reduced the weight of the liver more than Ap. FDAp2 had 6.9g and HDRv2 had 6.0g, both less than the positive control indicating that Rv at 1.0ml of the concentration used reduced the weight of the liver more than Ap for animals fed high fat diet.

The average weight of the heart for the negative control group was observed to be 0.53 while that for the positive control was 0.68g, a difference of 0.15g. Both NDAp and NDRv had a slight weight gain relative to the negative control. This showed that even with the normal feed, the heart increased in size as the rats grew but not as much as the with fatty food. FDAp1 had a slightly lower weight when compared to the positive control but for HDRv1, it was observed that the weight went higher than the positive control. This may be expansion of the heart due to fat accumulation. While the weight of HDAp2 and HDRv2 were lower than the positive control as well as $HDAp^1$ and HDRv1. Here the higher the concentration, the lower the weight of the heart.

The average weight of the lungs for negative control was 1.45g while that of Positive control was 1.55g, a weight gain of 0.1g. NDAp and NDRv had lower weight compared to the negative control, FDAp1 had 0.05g less than the positive control while FDRv1 had a difference of 0.17 less than the control. Also, FDRv2 showed a lower average weight compared to $FDAp^2$. This indicates that Rv had a more reducing effect on the lungs than Ap.

In the same trend, $FDAp^1$ had a higher weight of kidney than $FDRv^1$ relative to the positive control and the same went for $FDRs^2$ and $FDRv^2$. Though both NDAp and NDRv had the same slight lower weight when compared to the negative control.

Generally, from the result of the average organ weight of the rats across the eight groups, it was observed that group E, F, G and H who were fed fat diet and leave extracts of *A. paniculata* and R. *vomitoria* had higher average organ weight than the negative control but lower than the positive control that was fed only fat diet. Also, group C and D who took normal diet and extract of A. *paniculata* and *vomitoria* had an average weight lower than that of both negative control and positive control. Indicating that the different types of feed (Fat and normal diet) as well as the plant extract have an effect on the weight of the organs.

Growth/Skin Lesion

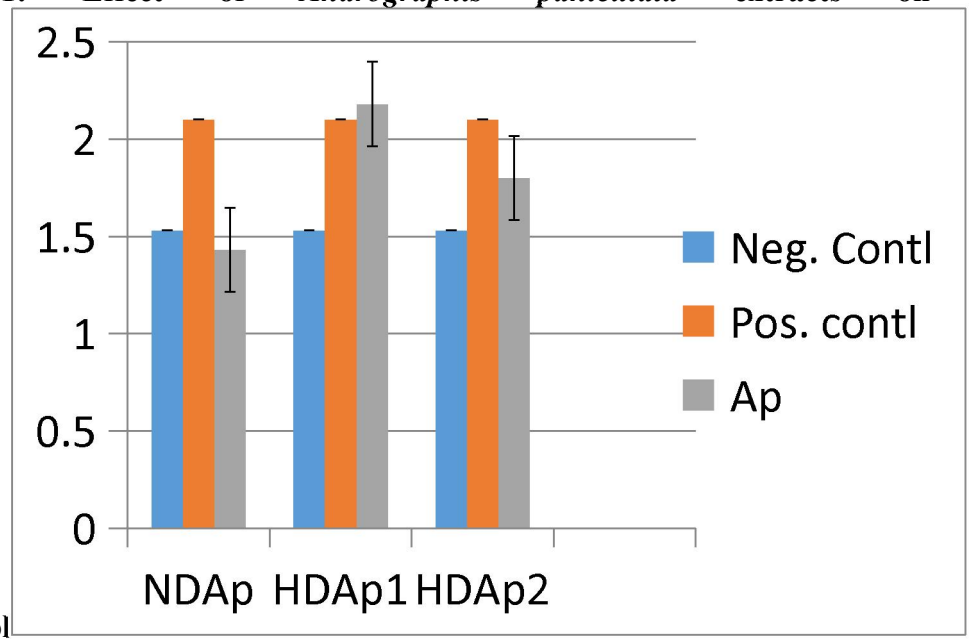
There was no observable crack, colouring, loss of hair on any of the rats and their growth rate was impressive.

Table 4: Effect of Leave Extracts of *Rauvolfia vomitoria* (Rv) and *Andrographis paniculata* (Ap) on Blood lipids of Rats Fed High Fats Diet and Normal Diet.

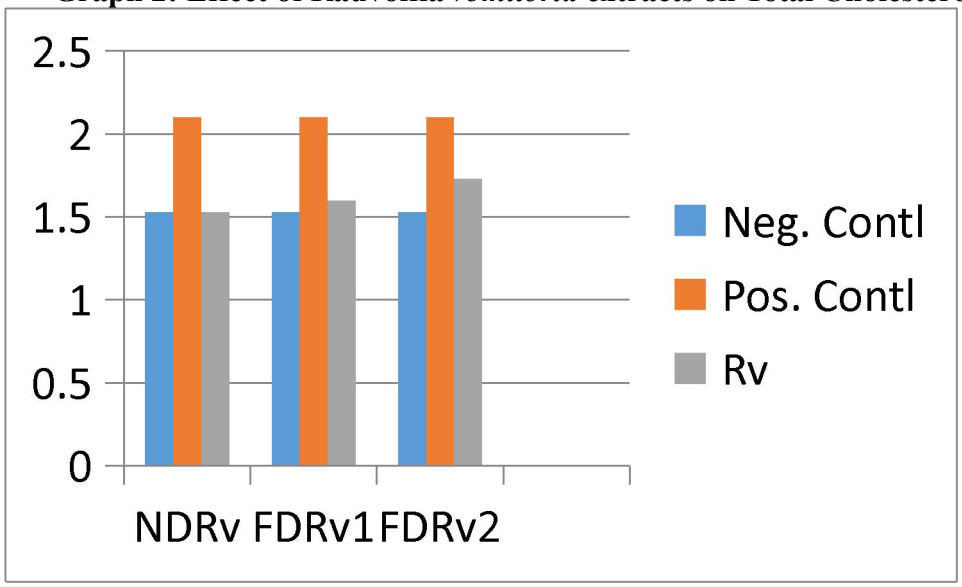
Group/ Treatment	Total Cholesterol (mmoi/l)	Triacylglyceride (mmoi/l)	High Density Lipoprotein (mmoi/l)	Low Density Lipoprotein (mmoi/l)
A (CTND)	1.53+_0.02^{b}	0.18+-0.02^{b}	1.08+_0.02^{c}	2.53+_0.03^{a}
B (CTFD)	2.10+_0.04^{e}	0.28+-0.02^{d}	1.18+_0.03^{d}	3.05+_0.59^{a}
C (NDAP)	1.43+_0.03^{a}	0.20+-0.04^{c}	1.10+-0.02^{d}	2.43+_0.03^{a}
D (NDRV)	1.53+-0.01^{b}	0.23+-0.02 ^{c}	1.13+-0.02^{d}	2.58+_0.04^{a}
E (FDAP^{2})	2.18+_0.02^{g}	0.15+-0.01^{a}	1.05+_0.01^{a}	3.15+_0.02^{c}
F (FDRV^{2})	1.60+_0.05^{c}	0.13+-0.02^{a}	1.03+_0.02^{b}	2.58+_0.02^{a}
G (FDAP^{1})	1.80+_0.02^{e}	0.25+-0.01^{c}	1.15+_0.01^{d}	2.85+_0.01^{b}
H (FDRV^{1})	1.73+_0.03^{d}	0.28+-0.03^{d}	1.18+_0.03^{e}	2.85+-0.04^{b}

KEY: CTND - Negative Control, Normal Diet, CTFD - Positive Control fatty diet, no treatment, FDAP^{1}-fatty Diet, 200mg/kg *Angdrographis paniculata*, FDRV^{1}- Fatty Diet, 200mg/kg *Rauvolfia vomitoria*, FDAP^{2}- 400mg/kg *Angdrographis paniculata*, FDRV^{2}- 400mg/kg *Rauvolfia vomitoria*, NDAP - Normal Diet, 200mg/kg *Angdrographis paniculata*, NDRV - Normal Diet, 200mg/kg *Rauvolfia vomitoria*

Graph 1: Effect of *Andrographis paniculata* extracts on Total Cholesterol

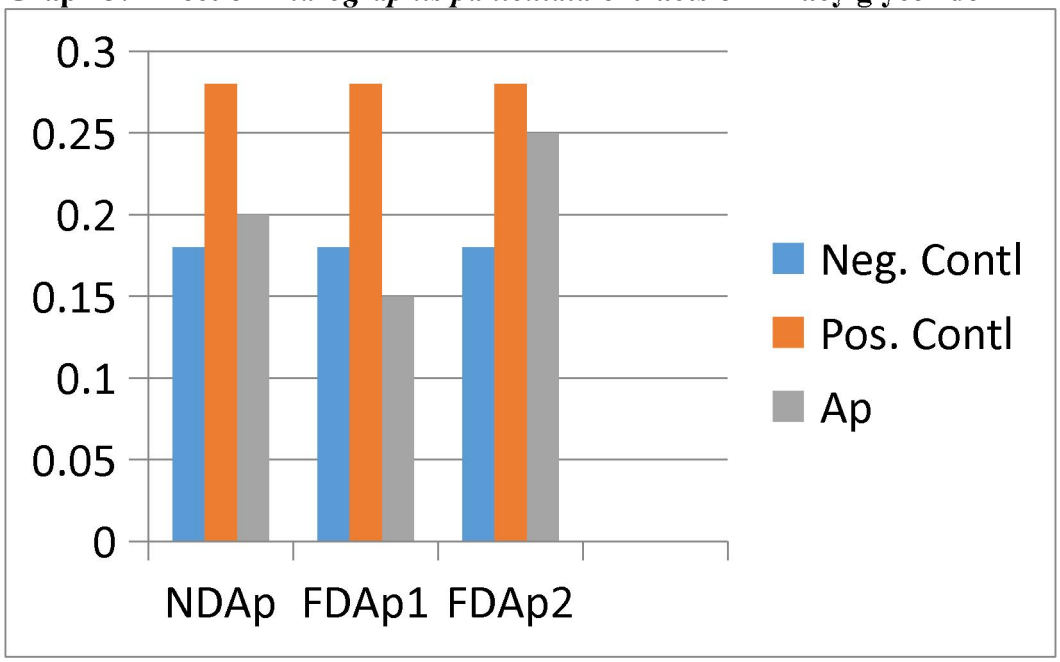


Graph 2: Effect of Rauvolfia *vomitoria* extracts on Total Cholesterol

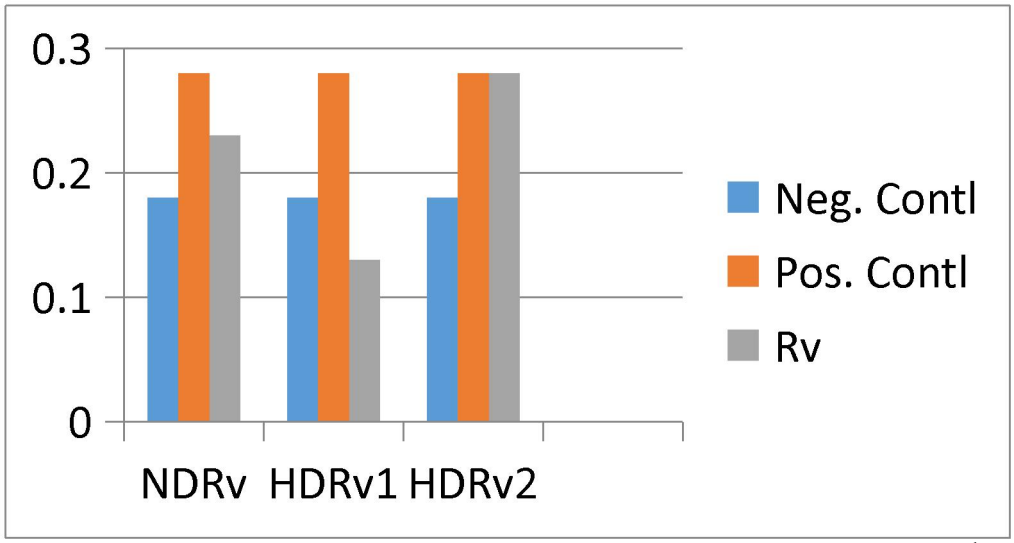


KEY: CTND - Negative Control, Normal Diet, CTFD - Positive Control, FDRV[1]- Fatty Diet, 200mg/kg *Rauvolfia vomitoria*, FDRV[2]- 400mg/kg *Rauvolfia vomitoria*, NDRV - Normal Diet, 200mg/kg *Rauvolfia vomitoria*, FDAP[1] -fatty Diet, 200mg/kg *Angdrographis paniculata*, FDAP[2]-400mg/kg *Angdrographis paniculata*, NDAP - Normal Diet, 200mg/kg *Angdrographis paniculata*

Graph 3: Effect of *Andrographis paniculata* extracts on Triacylglyceride

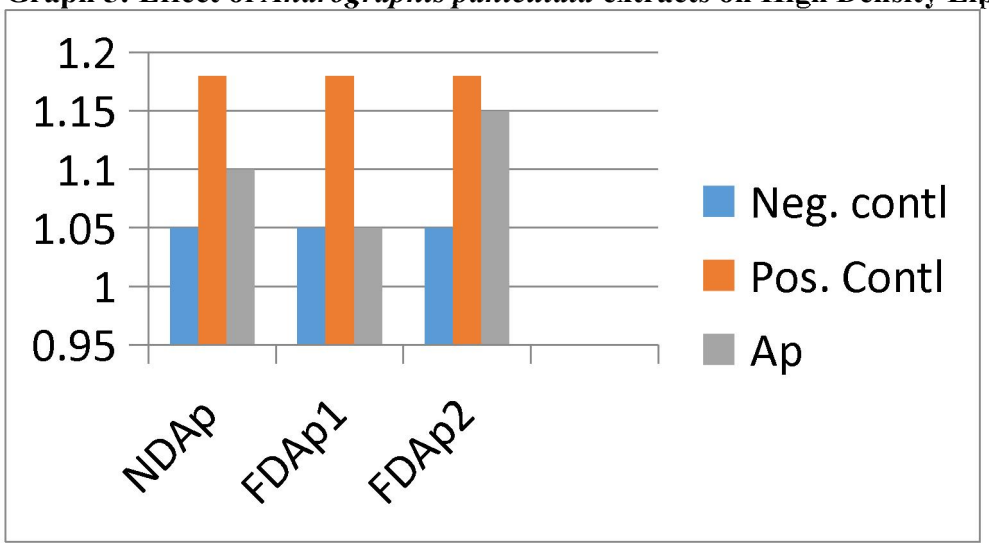


Graph 4: Effect of *Rauvolfia vomitoria* extracts on Triacylglyceride

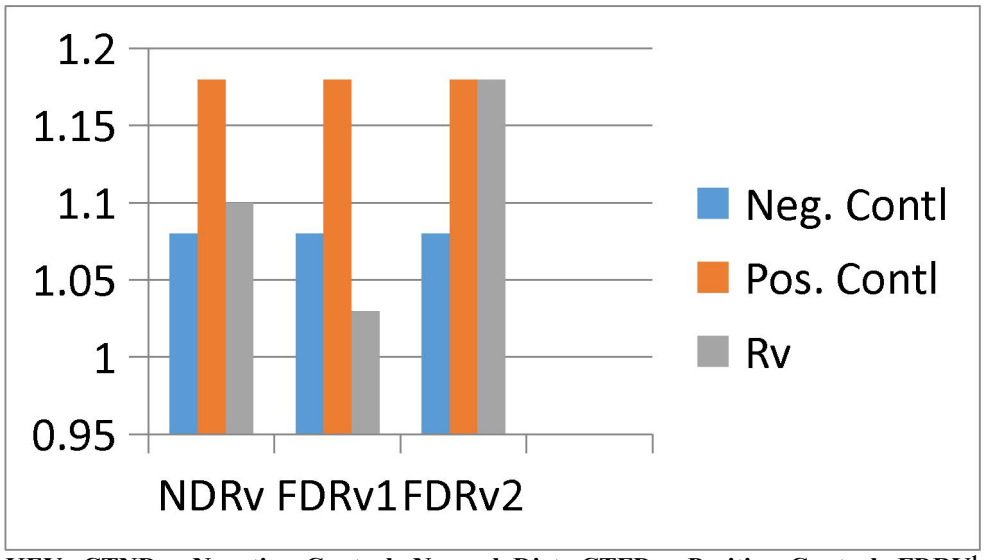


KEY: CTND - Negative Control, Normal Diet, CTFD - Positive Control, FDRV[1]- Fatty Diet, 200mg/kg *Rauvolfia vomitoria*, FDRV[2]- 400mg/kg *Rauvolfia vomitoria*, NDRV - Normal Diet, 200mg/kg *Rauvolfia vomitoria*, FDAP[1] -fatty Diet, 200mg/kg *Angdrographis paniculata*, FDAP[2]-400mg/kg *Angdrographis paniculata*, NDAP - Normal Diet, 200mg/kg *Angdrographis paniculata*,

Graph 5: Effect of *Andrographis paniculata* extracts on High Density Lipoprotein

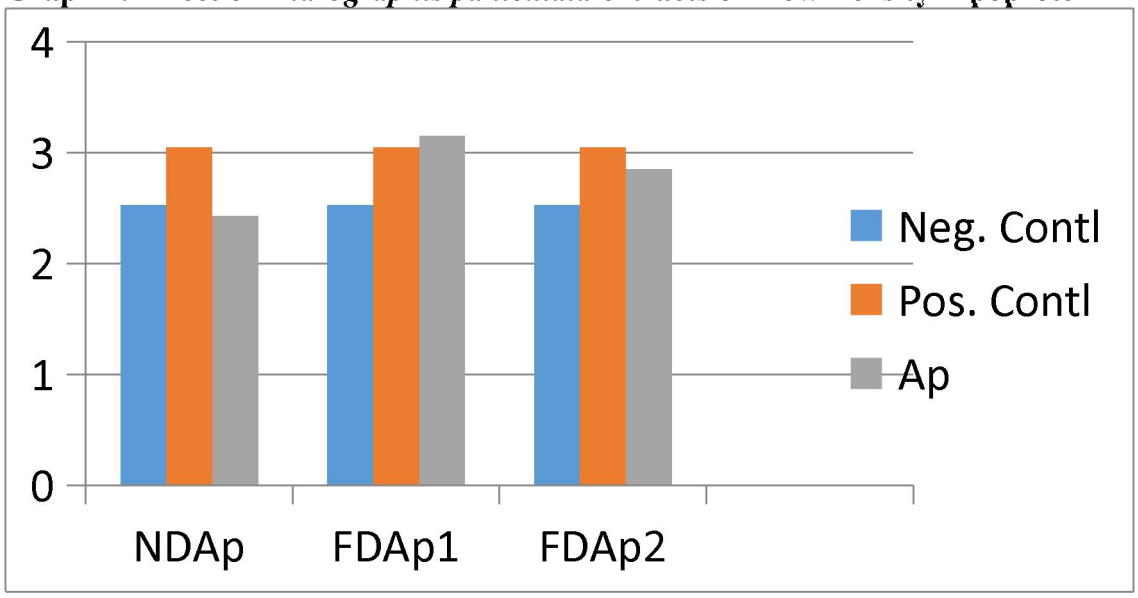


Graph 6: Effect of *Rauvolfia vomitoria* extracts on High Density Lipoprotein

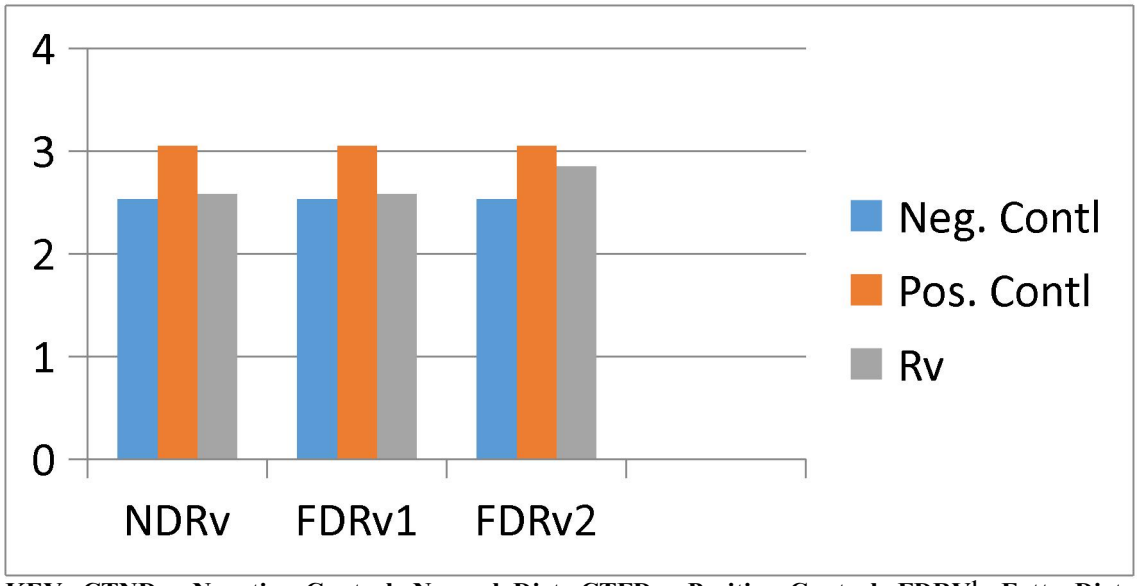


KEY: CTND - Negative Control, Normal Diet, CTFD - Positive Control, FDRV[1]- Fatty Diet, 200mg/kg *Rauvolfia vomitoria*, FDRV[2]- 400mg/kg *Rauvolfia vomitoria*, NDRV - Normal Diet, 200mg/kg *Rauvolfia vomitoria*, FDAP[1] -fatty Diet, 200mg/kg *Angdrographis paniculata*, FDAP[2]-400mg/kg *Angdrographis paniculata*, NDAP - Normal Diet, 200mg/kg *Angdrographis paniculata*,

Graph 7: Effect of *Andrographis paniculata* extracts on Low Density Lipoprotein



Graph 8: Effect of *Rauvolfia vomitoria* extracts on Low Density Lipoprotein



KEY: CTND - Negative Control, Normal Diet, CTFD - Positive Control, FDRV[1]- Fatty Diet, 200mg/kg *Rauvolfia vomitoria*, FDRV[2]- 400mg/kg *Rauvolfia vomitoria*, NDRV - Normal Diet, 200mg/kg *Rauvolfia vomitoria,* FDAP[1] -fatty Diet, 200mg/kg *Angdrographis paniculata*, FDAP[2]-400mg/kg *Angdrographis paniculata*, NDAP - Normal Diet, 200mg/kg *Angdrographis paniculata*,

As shown in Table 4 above, there was a clear significant difference between the negative and the positive control indicating that the diet administered had a great impact on the lipid profile concentration except for LDL which showed no significant difference. From the result obtained on Total Cholesterol, it was observed that the effect of the leaf extract of A.p on Group C (NDAp) who were fed normal diet was that it reduced the cholesterol slightly below the negative control while R.v showed no difference between NDRv and the negative control.

For FDAp[1], the concentration rose to 2.18mmoi|l which was higher than the positive control (2.10mmoi/l) while FDRv[1] gave a concentration of 1.60mmoi/l a value less than the positive control and FDAp2 had 1.8mmoi/l of cholesterol, FDRv2 had 1.73mmoi/l. This means that 0.5ml Rv produced a better result than 1.0ml while for Ap, 1.0ml gave a better result than 0.5ml.

In the case of the concentration of Triacylglyceride obtained, the positive control had a value of 0.18mmoi/l while the negative control had 0.28mmoi/l. FDAp[1] had a value less than both controls and FDRv[1] had a slightly lower value than FDAp[1] and the control. FDAp[2] had 0.25mmoi/l which is less than the control but FDRv2 showed no difference with the control.

HDL value revealed that FDAp[2] had the highest concentration compared to the other test groups for both A.p, R.v and the control groups. This is an advantage since HDL is referred to as the good cholesterol because of its function in carrying cholesterol to the liver for elimination. FDAp[1] had the lowest value compared with the experimental and the control groups for both Ap and Rv while HDL value rose slightly more than the negative control for NDAp and NDRv.

Also, for LDL, NDAp had a lower value than the negative control while

NDRv had a slightly higher value than the negative control.

FDAp1 rose higher than the control while FDRv2 and FDAp2 had a slightly lower concentration than positive control. This is indicating that at 0.5m Rv was more effective while at 1.0m both plants produced the same effect less than 0.5m.

It is expected from the research that organisms with a high level of cholesterol are at risk of having atherosclerotic hypertension. Therefore, the extract will have a lowering effect on blood pressure as it reduced cholesterol concentration. This agrees with its traditional use as well as previous work recorded by Okpako (1991) where atherosclerotic hypertensive patients treated with extract of Rauvolfia had a mild hypotensive effect after weeks of therapy. (Youmbie Djanche, et al.,2021)

Generally, from the result of the average organ weight of the rats across the eight groups, it was observed that group E, F, G and H who were fed fat diet and leave extracts of *A. paniculata* and R. *vomitoria* had higher average organ weight than the negative control but lower than the positive control that was fed only fat diet.

Also, group C and D who took normal diet and extract of A. *paniculata* and *vomitoria* had an average weight lower than that of both negative control and positive control. Indicating that the different types of feed (Fat and normal diet) as well as the plant extract have an effect on the weight of the organs.

The research agrees with the work of Owoade et al., 2021 and Ikwuka et al., 2023 which indicated hypolipidepic potential of *R. vomitoria.*

High cholesterol is a direct contributor to cardiovascular disease like hypertension which can lead to stroke and heart attacks. It has been reported that one out of every six people have high cholesterol, which means that one out of every six people has a high probability of developing cardiovascular diseases. The World Health Organisation estimates that almost 20% of all strokes and over 50% of all heart attacks can be linked to high cholesterol. Unfortunately, a lot of people don't take the risks of high cholesterol seriously which makes them vulnerable to heart diseases.

Conclusion

The study aimed to compare the effects of *Andrographis paniculata* and *Rauvolfia vomitoria*. On lipid profile s and selected organ weight in experimental Rats to evaluate their potential influence on metabolic health. The findings revealed no significant difference in the expressed hypolipidemic activity of both plants suggesting the potential for use as a prevention of atherosclerosis and hypertension. These results support their traditional uses in herbal medicine, but further research to determine the mechanism of action, effect on biochemical parameters and effect of prolonged usage is necessary to validate these findings.

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