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Heamatological Response of Wister Rat to *Occimum Gratisimum* Extract

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Abstract: *Changes in haematological parameters are important in the assessment of responses of humans and animals to various disease conditions. It can also serve as the basis of prediction of health outcomes. The heamatological response of wister rats to occimum gratisimum extract was assessed. Twenty-fiveWistarratsweighingbetween100-160gwereusedforthestudy.Theratswererandomly roupedintofive.Acontrolgroup,whilegroups1-4were theexperimentalgroups. Increasing doses (0.2,0.4,0.8and1.6gkg^{-1} body weight) of the aqueous exract was administered orally to the experimental groups 1-4 dailyfor the period of four weeks. Haematological parameters were analysed using standard procedure. The results show a significantly decrease in the haemoglobin level, packed cell volume and white blood cells in the experimental rats at p<0.05. The meancorpuscularhaemoglobinandthemeancorpuscularvolumedecreasedsignificantlyi n t h e e x p e r i m e n t a l g r o u p s comparedtothecontrol. Also, the haematological responses was found to be inversely related to the dose of the Occimum gratisimumextract.*

Key words: *Haemoglobin, Extract, Wister, Rats and Occimum gratisimum,*

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I. Introduction

Plants have been historically usedbymanforthetreatment and managementofmanydiseasesand thispracticeof using herbs is still very popular in many developingcountriesand Nigeria is not an exception(1, 2).The advocacy for organic and natural product have also driven many people to preferring herbs over the orthodox medicine and this practice isgradually becoming more popular insomepartsofEuropeand NorthAmericaas well as developing countries like Nigeria. (3). However, poverty and a number of other factors such as illiteracy and in adequate health infrastructure among others have contributed to the increase in the use of these medicinal herbs in tropical areas. Because this herbs are seen to be more cost effective and accessible to people in resource limited settings.

Theneedtostay healthy and strong cannot be overemphasize because good health is very vital to human productivity and livelihood. The need of individual to have good health status and optimum immunity to help defend the body against pathogenic organism ad invaders is vital human existence.The prognosis of most diseases is dependent on the immunity level of the individual in question and some herbsare said to help boosttheimmunesystem.(4). This is true of farm animals, especially mammals.

Changes in haematological parameter are important in the assessment of responses of humans and animals to various disease conditions (5, 6, 7). Also, haematological parameters are often used to define the presence and extent of oxidative stresses due to nutrition and some physiological conditions (8). Also, nutrient composition of foods and feeds have been reported to trigger some haematological responses. (9). Animal studies have additionally shown that there can be variations in haematological parameters between different breeds of farm animals (9). Earlier studies have shown that haematological responses , are valuable in accessing toxicity, and tolerable levels of food component as well as the physiological responses and health status of farm animals (10, 11).

Herbs like *Occimum gratisimum* popularly called "efinrin" is one of the most common herbs used in Nigeria delicacies. It is believed to have great medicinal value in improving health status of individuals. It is an integral part of many soups, herbal mixtures and many health claims have been ascribed to this leaf. However, there is dearth of data on an evidence based reports on this leaf as the use of the leaf have been handed down from one generation to the other as a universal medicine. Therefore, this study aims to the determine the haematological responses to the ingestion of *Occimum gratisimum* in albino rats kept under laboratory conditions

II. Materialsandmethods

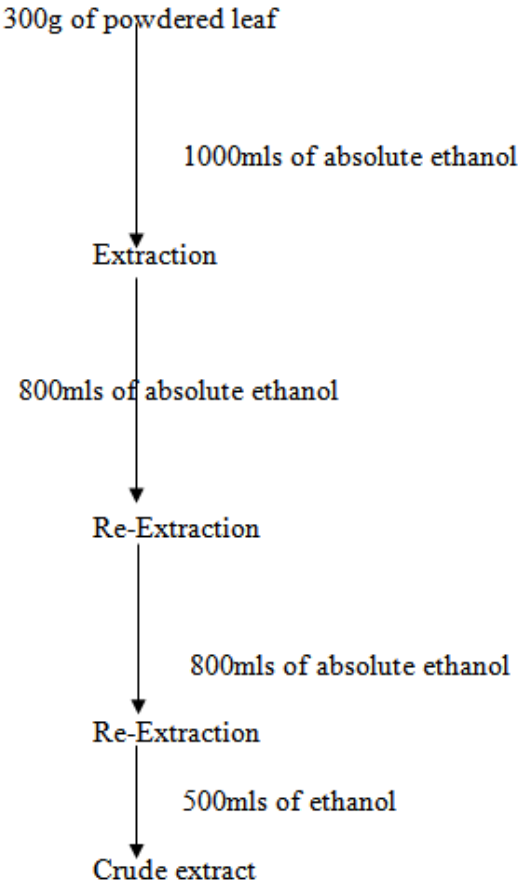
Collection, Authentication and Preparation of Plant Material

The leaves of *Occimum grastissimum* was collected from Ijebu-Ode. The leaves were dried in the absence of sunlight for two (2) weeks.The dried grinded leaves of *Occimum grastissimum* was soaked in 1000mls of absolute ethanol at room temperature for three (3) days after leaves was re-extracted in 800mls of ethanol for another three days, the leaf was finally re-extracted with 500mls of ethanol to allow maximum extraction of *Occimum grastissimum*. The ethanolic filtrate was then oven dried at 35^0c until a dried powdery mass was formed.

MATERIALS AND CHEMICAL USED

- Wister Rats
- Cage
- Heparinized bottle
- Oven
- Syringe and needles
- Oral Cannula
- Weighing scale
- Ethanol

Extraction Procedure



Animal selection

Twenty-fiveWistarratsweighingbetween100-160gwereusedforthestudy.Theratswerepurchasedfromtheanimalhouseat Sango Ota. Theywerebred for weeksat the School laboratory.Theratswerefedwithpelletsgrowermashobtainedfroma localfeedmill, andwithwater duringthebreedingperioddesignedtoacclimatizetherats.Theratswerepickedatrandomandgroupedintofive.One group was randomly selected to be controlgroup,whilegroups1-4were theexperimentalgroups.Eachofthe ratsweremarkedatthetailwithdifferentcoloursofpenmarkerandputintodifferentsegmentsofthecage,accordingt

otheirgroup.

AdministrationofExtract

Theaqueousextractwasadministeredorallyusing acalibratedsyringewithattachedrubbercannula.Theanimalsreceiveddoses of the extractdailyforfourweeks.Controlgroupreceivedaquantityofwaterequivalenttothevolumeingroup4.Groups1,2, 3and4receivedtheaqueousextractof*Ocimumgratissimum*atdosesof 0.2,0.4,0.8and1.6gkg^{-1} respectively. Theratsweresacrificedafterfourweeksofextractadministrationusingcervicaldislocation.Bloodfrom eachratwascollectedintolabeledheparinizedbottletopreventcoagulationoftheblood.

HematologicalParameters

EvaluationofthehematologicalparameterswascarriedoutusingautomatedhaematologicalAnalyzerK-X-21madebySymex,Kobe,Japan.SamplesofbloodfromtheWisterratsinheparinized bottle wereanalyzedusingstandard procedures (5, 12).Dataobtainedwereanalysedusingt-testandchisquare.Levelofsignificancewaspredeterminedasp<0.05.

RESULTS

Theshows theeffectofdifferentdosesofaqueousextractof*Ocimumgratissimum*onthehaematologicalparameters. ThemeanHaemoglobindecreasedsignificantly(p=0.04)ascomparedwiththecontrolgroupasshownintable1.Both themeancorpuscularhaemoglobinandthemeancorpuscularvolumedecreasedsignificantlyascomparedwiththeco ntrol(p=0.0217).

Table1:Effectofleaf extractof*Ocimumgratissimum*onRBCcount, MCVandMCH

Groups	RBC(x10^{12}/L)	MCH(pg)	MCV(Fl)
Control	7.59	20.67	57.67
0.2g/kg	7.08	19.75	55.25
0.4g/kg	6.92	19.59	53.25
0.8g/kg	6.33	19.5	51.75
1.6g/kg	5.57	18.4	50.8

Table 2 shows that thewhitebloodcellandplateletscountsdecreasedintheexperimentalgroupscomparedwiththecontrolgroup.

Table2: Effectofleaf extractof*Ocimumgratissimum*onWBCandplatelets

Groups	Whitecell count	Plateletcount (x10^{9}/L)
Control	10.03±0.031	**798.7±2.30**
0.2g/kg	8.03±0.024	**660±1.42**
0.4g/kg	6.65±0.041	**581.5±2.51**
0.8g/kg	5.58±0.015	**524±3.01**
1.6g/kg	4.08±0.024	584±2.08

Table 3 Table 2 shows that themeanpackedcellvolume(PCV)valuein the treatedanimalswassignificantlyreduced(p=0.031)attheendofthetreatmentperiodascomparedwiththecontrolgro up.

Table3: Effectofleaf extractof*Ocimumgratissimum*onPCV

Groups	PCV(%)
Control	32
0.2g/kg	30
0.4g/kg	28.75
0.8g/kg	25.25
1.6g/kg	19.6

III. Discussion

The study testedtheeffectofaqueousextractof*Ocimumgratissimum*onhematologicalparametersofwisterrats.Theresultso fthestudyshowthat,theleafextractof*Ocimumgratissimum*administeredatthedosagesusedandfortheduration oftheexperimentsuppressthehaemopoeticsystem.

Thehemoglobinvaluesattheendoftheexperimentshowedareductioninthehemoglobinlevel,thisisinagreement with thefindingofEphraim*etal* (13)inwhichthe hemoglobinvaluedecreasesignificantlyafteradministrationofaqueousextractof*Ocimumgratissimum*tothe rats. Also, there wasadecreaseinthePCVvalueascomparedtothecontrol,thisagreeswiththefindingofObianime *et al*(14) who showed the effect of aqueous *Ocimumgratissimum*extract on male mice. This maught be due to the presence of some anti-nutritional compounds such as tannins and saponins which will inhibit the absorption of other nutrients (2)

The study showed a significant decrease in packed cell volume, and neutrophils however, the decrease observed in the haemoglobin level was not significant. This disagrees with the study of Ojo et al (2) where the decease observed in the haemoglobin levels was significant. Thereductionmayhaveoccurredduetolysisofbloodcellsandprobably suppressionofbloodcellsynthesisbysaponinsand other anti-nutrient foundinthe leafextract (15).Saponinsareknowntobetoxictobodysystems (16).In spite ofthe growingacceptanceof theplantaspart of food ingredients and use inherbalmedicine,theextracthasbeenshowntooverwhelmthehaemopoeticsystem.Therefore, habitual usage can be injurious to health. (17)

The study also showed a progressive reduction in increased usage of the extract from *Ocimumgratissimum.*Bloodplateletsareknown to be part of the mechanism ofbloodclotting.A low blood plateletconcentrationimplies that theprocessofbloodclotting willbeprotracted which will invariably bring abouttoo muchblood lossinthecaseofinjury.The findings of this study may be able to suggest the implication of habitual consumption of this plant on the health of the individuals.

IV. Conclusion

Inconclusion,thestudyshowsthattheleafextractof*Ocimumgratissimum*administeredatthedosagesusedandforthe durationofthe experimentsuppressthehaemopoeticsystem.

Recommendations

In the light of the findings of the study, the following are hereby recommended:

- The leaves of *Occimum gratissimum*, having been found to have haematological effect however, further studies should be done to determine the safe levels for usage.
- Humans may need to be courteous in the consumption of *Ocimumgratissimum* so that it will not negatively impact the production of blood cells.

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