X-Ray of the Haematological and Hamostatic Effect of Aqueous Extract of Piper Plant (Uziza) and Xylopa Aethiopica (Uda) in Postpartum Women in Imo State Nigeria

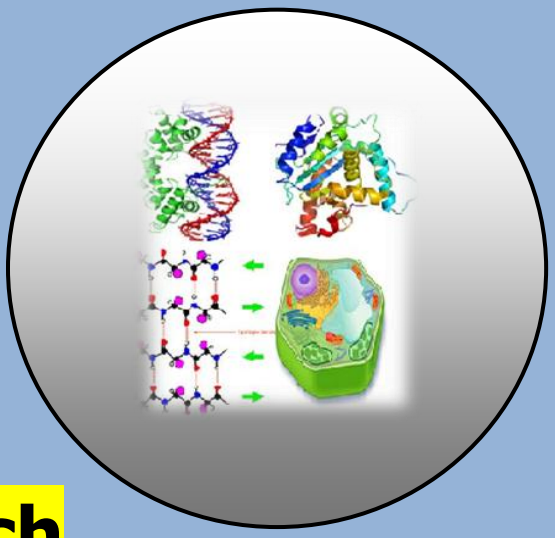
By

F.N. Oguwike, C.C. Offor and S. O. Ebede

ISSN 0970-4973 Print
ISSN 2319-3077 Online/Electronic

Global Impact factor of Journal: 0.756
Scientific Journals Impact Factor: 3.285
Index Copernicus International Value
IC Value of Journal 6.01 Poland, Europe

J. Biol. Chem. Research
Volume 32 (2) 2015 Pages No. 643-649



Journal of Biological and Chemical Research

An International Peer reviewed Journal of Life Sciences and Chemistry

Indexed Abstracted and Cited in about 25 different Scientific Databases around the World

Published by Society for Advancement of Sciences®

J. Biol. Chem. Research. Vol. 32, No. 2: 643-649 2015
(An International Peer reviewed Journal of Life Sciences and Chemistry)
Ms 32/2/10/2015

ISSN 0970-4973 (Print)
ISSN 2319-3077 (Online/Electronic)

Dr. F. N. Oguwike
http:// www.sasjournals.com
http:// www.jbcr.in
jbiolchemres@gmail.com
info@jbcr.in

RESEARCH PAPER

Received: 16/04/2015 Revised: 15/07/2015 Accepted: 20/07/2015

X-Ray of the Haematological and Hamostatic Effect of Aqueous Extract of Piper Plant (Uziza) and Xylopa Aethiopica (Uda) in Postpartum Women in Imo State Nigeria

F.N. Oguwike, *C.C. Offor and **S. O. Ebede
Department of Physiology, Faculty of Basic Medical Sciences, Anambra State University Uli, Nigeria
***Department of Medical Biochemistry, Faculty of Medical Basic Sciences Anambra State University Uli, Nigeria**
****Department of Medical Microbiology, University of Nigeria Teaching Hospital Ituku Ozalla, Enugu State Nigeria**

ABSTRACT

Plants and plant extracts have been found very useful for purposes of treatment of disease among other benefits. X. aethiopica and piper plant are such ones whose effects on the haemostatic mechanism of post-partum women were studied. Results showed that the combined aqueous extracts had no effect on the haemoglobin and packed cell volume of postpartum women but increased the white blood cell count, platelet counts and lymphocyte percentage count. It reduced the clotting, bleeding and prothrombin times. Calcium ii believed to be acting through the pathway of Prothrobin complex thus converting it to thrombin in post partum women. The combined extracts of X. aethiopica and Piper plant contain some actuve principles that are effective in arresting blood flow during hemorrhage and it is believed to be calcium like.

Key Words:* Haemostasis, X. Aethiopica, Haemoglobin, Postpartum, Prothrombin, Piper Plant and Bleeding Time.

INTRODUCTION

Medicinal plants are those plants which contain substances used for the treatment or prevention of diseases or infections, and other health disorders in human body (Nwachukwu et al, 2010). In other words, they have some physiological effect on the body chemistry. The medicinal value of plants is due to substances found in the plant tissues that

produce a physiological action on the human body. The most important of these substances are the alkaloids, fixed oil, essential oil, tannins, resins etc (Nwachukwu et al, 2010).
Also every found substance consumed by humans has either a therapeutic, nutritional or toxic effect on the body. These food substances when got in their crude from can be of immense help in curing of some ailments (Uzodike et al, 2010). X. aethiopica (Uda) and Piper plant) Uziza) hae ben plants of great use in post partum women in Ogwa Imo State. X. aethiopica is common in ethno-medicine in West Africa. Its combination with Piper plant or pepper plant in preparing watery soup along with other ingredients for postpartum mothers few hours after delivery is what prompted my curiosity to know their effect in haematological and haemostatic mechanism of postpartum mothers. Piper or pepper plants are an economically and ecologically important genus in the family piperaceae. Pepper plants belong to the magnoliids (Wikipedia 2010) which are angiosperms but neither monocots nor eudicots. Piper species have a pantropical distribution, and are most commonly found in the tropical rain forest in Japan, Korea, West Africa etc. *Xylopia aethiopica* (X. aethiopica) commonly known as "African guinea pepper or Ethiopian pepper is wide spread in tropical Africa, Zambia, Mozambique and Angola (Puri et al, 1978). In Nigeria, it is found all over the lowland rain forest in the savanna zones of Nigeria Negro pepper as it is known has been usd as pepper substitute in Europe and India (Sofowara 1978). Chemical contents of *Xylopia aethiopica* and piper plants are minerals, vitamins, polysaccharides, limonoids, fibers, calcium, alkaloids, capsaicin, lutein, oxalic acid and piperine.

MEDICINAL USES

Piper plants (P. darienense) is used medically by the kuna people of the Panama Columbia border region and elsewhere, it is used to intoxicate fish and then can easily be caught. Spiked peper often called matico appears to have strong detoxifying effect, the fruit extract has been shown to be active as antimicrobial agent against gram positive and gram negative bacteria though it has not been shown to be effective against *Escherichia coli* (Iwu 1993).
Xylopia aethiopica has anti-spirochoectal properties so that it works both as a preservative measure and in treatment of primary, secondary and tertiary stags of syphilis (Mitro et al, 1967). *Xylopia aethiopica* has been used for treating rheumatism and arthritis as well as other inflammatory conditions. Numerous research studies have been confirmed the species anti-inflammatory and antipyretic (Fever reducing) properties (Lawal et al, 2010). The seeds are mainly used by traditional medicine healers and cal also serves as an alternative to pepper (Agoha, 1974). Medical uses of the plant are as a carminative, as cough remedy and as a postpartum tonic and lactation, treatment of stomache, bronchitis, biliousness and dysentery. It has also been reported to be used as a flavonoid when steeped in palm wine is given for attacks of asthma and rheumatism.

MATERIAL AND METHODS

SUBJECTS SELECTION

Subjects of study consist of post partum women of 29-36 years attending maternity hospital at Aladimma Maternity Ogwa. They were provided with piper plant and *Xylopia aethiopica* (uda) immediately after birth and were encouraged to use the plants in making tonics and drinking them on daily bases for 30 days.

The apparenthly healthy subjects were tonics as directed by the researchers. Thirty (30) female postpartum subjects were used for this study and their blood samples were collected and tested with the standard laboratory tests for full blood count, white blood cell differentials, platelets, bleeding and clotting times and prothrombin times.

EXPERIMENTAL DESIGN

Thirty (30) female postpartum women of age range (30-36yrs) who successfully delivered babies were selected for this study. They weighed about 65-75kg. they were grouped in three groups; Group A (control), Group B (High dose) and Group C (Low dose). Each group consists of 10 persons. The test groups B and C were administered with the combination of the plant extracts in high dose (Group B) and low dose (Group C) while the test subjects did not receive plant extracts.

PREPARATION OF COMBINED TONIC OF PIPER PLANT (UZIZA) AND *Xylopia aethiopica* (UDA)

Piper seed and *Xylopia aethiopica* seed were purchased from Afo Ogwa Market of Alaenyi, Imo State. It was identified by a taxonomist (Nwachukwu et al, 2010). The seeds were weighed, washed, and allowed to dry in the sunlight. They were pounded in a mortar with pestle (Samuelson et al, 1992) later they were grounded into fine powder. After grinding, it was sieved to remove fibers; later 5.0g of the powder was mixed with 100ml of distilled water to give a concentration of 5g/100ml. This was used as higher concentration given to Group B female subjects. The lower concentration was prepared by dissolving 2.5g of the powder with 100ml of distilled water to give a concentration of 2.5g/100ml. this concentration was given to Group C postpartum women. The usage of the extract lasted for 30 days acute study.

PHYTOCHEMICAL ANALYSIS OF SEEDS

The seeds of the plants were screened for presence or absence of various secondary metabolites using standard phytochemical screening procedures as described by Harbournes (1973), Trease and Evans (1996) respectively. The extract was tested for glycosides, flavonoids, alkaloids, tannins, reducing sugars, calcium, saponins, acidic compounds, resins, fats and oils, carbohydrates and steroids.

TOXICITY STUDIES

The LD_{50} of the extract in albino mice was determined using Lork's method (1983). The procedure of determining the lethal dose is by increasing the concentration of the extracts administered into the mice (per body weight) in each group of eight (8) mice for five days. The doses used were 500mg/kg, 1000mg/kg, 1500mg/kg, 2000mg/kg, 3000mg/kg, 4000mg/kg, 5000mg/kg and 6000mg/kg. The mortality rate was determined after 18hrs and analyzed graphically.

DETERMINATION OF HAEMOSTATIC AND HAEMATOLOGICAL INDICES

At the end of the acute administration of the extract in the postpartum women, blood samples were collected into EDTA sequesterene bottles (FBC tests), sodium citrate bottles (Haemostasis tests) and Ammonium oxalate bottles (Platelet count). Haemoglobin concentration was determined by method described by Baker et al (1985), The packed cell volume was done by the simple method of microhaematocrit centrifugation (Baker et al, 1985).

The total white blood cell count and differentials were also determined by the method of baker et al, 1985. The platelet count was done as described by Breecher and Cronkite (1950) while the whole blood clotting times was determined using the method of Lee and White (1985), the bleeding time was carried out as described by Dejana et al, 1982 while the Quicks one stage method (1985).

STATISTICAL ANALYSIS

The results obtained in the study were presented as Mean and Standard deviation (Mean ± S.D) and students' t- test was done to determine the level of significance.

RESULTS

Table 1. The phytochemical analysis of *X. aethiopica*.

	CONSTITUENTS IN EXTRACT OF *X. aethiopica*						
	Reducing sugars	Flavenoids	Carbohydrates	Calcium	Tanins	Resins, Steroids, Acidic compounds, Terpenoids, Fats and Oil	Alkaloids, Saponins
Degree of Concentration	+	+	++	+++	-	-	++

- Negative (absent),
+ Present in small concentration,
++ Present in moderate concentration,
+++ Present in very high concentration.

Table 2. The phytochemical analysis of Piper plant.

	CONSTITUENTS IN EXTRACT OF PIPER PLANT						
	Reducing sugars	Flavenoids	Carbohydrates	Calcium	Glycosides	Resins, Steroids, Acidic compounds, Terpenoids, Fats and Oil, Tannins	Alkaloids, Saponins
Degree of Concentration	-	++	+	++	-	-	++

- Negative (absent),
+ Present in small concentration,
++ Present in moderate concentration,
+++ Present in very high concentration.

Table 3. Haematological and haemostatic indices of postpartum women before and after administration of combined extracts of *X. aethiopica* and piper plants.

EXTRACTS	Hbg/dl ± S.D	PVC ± S.D	Platelet count x 10^9/l ± S.D	Bleeding Time min ± S.D	Clotting Time min ± S.D	Prothrombin Time ± S.D
Control n=10 (Extract free) Group A	14.2 ± 0.7	43 ± 2.1	175000 ± 250	5.02 ± 2.0	8.0 ± 0.3	11.0 ± 2.0
Day 1before extracts	14.8 ± 0.6	43.4 ± 1.8	177000 ± 208	5.05 ± 0.8	8.5 ± 0.2	10.4 ± 0.5
30 days after administration of extracts of X. aethiopica and piper plant. High dose n=10 Group B	15.0 ± 0.2	45.4 ± 0.5	210000 ± 420	3.0 ± 0.4	6.0 ± 0.4	10.0 ± 0.2
Low dose n=10 Group C	14.9 ± 0.4	44.7 ± 1.2	208000 ± 380	3.0 ± 0.2	6.0 ± 0.2	10.0 ± 0.2
Level of significance	P>0.05	P>0.05	P<0.05	P<0.05	P<0.05	P<0.05

Table 4. White blood cell counts and differentials in postpartum be administered of combined extracts of*X. aethiopica* and piper plant and thirty (30) days after the administration of thecombined extracts of *X. aethiopica* and Piper plant.

EXTRACTS	WBC per mm^3 ± S.D	N% ± S.D	L% ± S.D	E% ± S.D	M% ± S.D	B% ± S.D
Control n=10 (Extract free) Group A	5,240 ± 328	51 ± 0.4	47 ± 0.2	1.0 ± 0.3	1.0 ± 0.2	0 ±0
Day 1before extracts	5,360 ± 252	53 ± 0.7	44 ± 0.2	2 ± 0.5	1 ± 0.3	0 ±0
30 days after administration of extracts of X. aethiopica and piper plant. High dose n=10 Group B	13580 ± 670	24 ± 0.4	74 ± 0.6	0 ± 0	2 ± 0.3	0 ±0
Low dose n=10 Group C	12460 ± 320	26 ± 0.7	70 ± 0.4	1 ± 0.2	3 ± 0.4	0 ±0
Level of significance	P<0.05	P<0.05	P<0.05	P>0.05	P>0.05	P>0.05

Figure 1. The lethality study of combined aqueous extract of *X. aethiopica* and Piper plant.

DISCUSSION

The haematological and haemostatic effects of piper plant and *Xylopia aethiopica* in postpartum women have been x-rayed. In this research, it was shown from the phytochemical studies that the presence of typical plant constituents (Okoli et al, 2007) such as carbohydrate, calcium, alkaloids, reducing sugar, flavonoids and glycosides, while other constituents such as tannins, resins, terpenoids, acidic compounds, steroids, fat and oil were absent. The acute toxicity showed that the concentration of combined aqueous extracts of Piper plant*Xylopia aethiopica* used throughout the 30 days duration of administration was safe. The Mean value of haemoglobin concentration (g/dl) and packed cell volume in control and test subjects were not significantly varied (Table 2) rather there was a marked increase in white blood cell count, platelet count in Test subjects (Group B and C).

The leucocytes observed could be physiological resulting from stimuli that include taking in Piper plant and *Xylopia aethiopica* extract which is pepperish. X-ray of the haemostatic effects in postpartum women showed that it arrested bleeding and clotting time's hence demonstrating haemostatic activity. It also shortened the prothrombin time. This could be due to presence of calcium and alkaloids (protein precipitant) contained in this plant extract which are known to be involved in the precipitation of coagulation factors (Taofeeq et al, 2005). This haemostatic activity could be the understanding behind its popular usage in the eastern part of Nigeria in postpartum women.

ACKNOWLEDGEMENTS

RFERENCES

Agoha, C. 1974. Medicinal plants of Nigeria: offset- Happen, Netherlands pp 86.

Baker, F.J., Silverton 1985. The Full Blood Count. Introduction to Medical Laboratory Technology. Butterworths Publications, Woburn London P348.

Harbourne, J. B. C. 1973. Phytochemical Method Chapman And Hll, London P 269.

Iwu, M. 1993. Handbook of Africa Medical Plant, Crc Press, Pp 435.

Lawal, I.O, Igboanugo, A. B. I, Osikarbor, B, Duyilemi O. P, Adesoga, A. A and Adeyanju B. A. 2010. Evaluation of Plant-Based Non Timber Forest Products (Ntfps) As.

Lee, L. and White, W. 1985. Investgation for Haemostatic Abnormalities Introduction.

Lorke, D. 1983. A New Approach to Practical Acute Toxicity Testing. *Arch Toxicol.* 54: 275-278.

Mitra, C.R and Misra, P.S. 1967. Amino Acids of Processed Seed Meal Proteins. *J. Agric. Food Chem*. 15 (4): 697700.

Nwachukwu, C.U, Ume N, Obasi N. M, Nzewuihe G.U. and Onyirioha, C.U. 2010. Qualitative Uses of Some Medicinal Plants in Ikeduru L. G. A Of Imo State, Nigeria. New York *Science Journal,* 2010: 3 (11): 129-134. Issn: 1554-0200.

Okoli, C.O., Akah, P.A. and Okoli, A.S. 2007. Potentials of Aspillia Africa (Compositae) In Wound Care: An Experimental Evaluation. Bmc Complement. *Allen Med*. 2007:7. 24. Published Online 2007. July 10 Doi: 101186/1472-24.2007. Okoli Et Al License Biomed Central Ltd.

Puri, S.G. and Talata, O. 1978. Paper Presented In a Symposium on Recent Advances in the Development, Production and Utilization of Medicinal and Aromatic Plants in India. A Survey of Somplants Used in Native Medicine of West Africa of Interest to India P. 35.

Samuelson, G., Farah, M.H. and Percleesson, E. 1992. Investigation of Plants Used in Traditional Medicine in Soalia. 11 Plants of the Families Combretatance Labiates. *Journal of Ethnopharmacology,* 37 (1) 47-70.

Sofowara, E.A. 1978. Medical Plants and Traditional Medicine in Africa. The Pitman Press, Bath, *Avon,* Pp 314-318.

Taofeeq, O., Oyenyi, M. A. and Tesleem, A.O. 2005. Mechnism of Actions of Iathropha Gossypfolia Stem Latex as a Haemostati Agent. *European Journal of General Medicine* 2(4): 14-145.

Trease, G.E. and Evans, W.C. 1996. Textbook Of Pharmacognosy, 14th Ed, W. B Saunders, London P 11.

Uzodike, E.B. and Onuoha, I. N. 2010. The Effect of *X. Aethiopica* (Uda) On Intraocular Pressure. Department of Optometry, Abia State University Uturu, Abia State. Jnoa-Vol 16, 2010.

Wikipedia 2010, the free encyclopedia; Piper.

Corresponding author: Dr. F.N. Oguwike, Department of Physiology, Faculty of Basic Medical Sciences, Anambra State University Uli, Nigeria
E-mail: triumphfrancis@yahoo.com foguwike@gmail.com **Phone: 08037791363**