Determination of Mineral Content, Proximate Analysis and Composition in *Vernonia Amygdalina* Leaf Samples from Taraba North, Nigeria

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DOI: 10.29322/IJSRP.12.08.2022.p12826
http://dx.doi.org/10.29322/IJSRP.12.08.2022.p12826

Paper Received Date: 15th July 2022
Paper Acceptance Date: 30th July 2022
Paper Publication Date: 6th August 2022

Abstract- The determination of minerals elements and proximate analysis of vernonia amygdalina samples was taken from Sabon-gari area, Koffai area and Mile 6 areas, all in Taraba North with the view to evaluate the mineral content of the samples using standard methods. The mineral content of the sample shows; (Mn, K, Mg, Na, Ca, Cu, and Fe) Using atomic absorption spectroscopy (AAS). The results of the samples are: Mn (32.61±0,00), K (2.43±0.00), Mg (0.83±0.06), Na (21.38±0.06), Ca (35.43±0.01), Cu (1.39±0.01), and Fe (12.51±0.05) all measured in mg/100 g. The elements show that Ca, Mn and Na are the most abundant minerals, followed by Fe, K, Mg and Cu. The nutrient composition of the proximate concentrates revealed Moisture (8.16±0.26), Crude protein (18.58±0.14), fat (3.36±0.10) Crude fibre (12.45±0.11) Ash (6.80±0.15) Carbohydrate (37.83±0.0).

Index Terms- *Vernonia amygdalina, minerals Element, concentrates.*

I. INTRODUCTION

Vernonia amygdalina is scientifically classified as belonging to the kingdom *plantae*. It is an angiosperm, of order *Asterales* of the family *Asteraceae*, genus *vernonia.* a bitter leaf plant as the name implies whose leaves extracts, stems and bark are use for culinary, medical and curative purposes. The leaf contains unlimited benefits which shall be fully analyzed. There are many types of this plant, which include V*ernonia Arborea*, which specie distribution include: India, China, Malaysia and Thailand. V*ernonia Bamendea*, its distribution is found from Cameroun highland, Nigerian Mambilla Plateau. V*ernonia Blodgetti*, it is used and recommended for natural landscape and habitat restoration, its distribution includes Florida USA, Northern Bahamas. The predominant specie found in Nigeria is the V*ernonia amygdalina*, its distribution include Tropical Africa, e.g. Zimbabwe, Nigeria, Benin etc. The plant has structural adaptation tendency that enables it to survive in both areas of high rainfall and average rainfall, making it readily available in all season. In southern part of Nigeria, the leaves are broader, fresher and can grow above 23ft. The roots are anchored strongly on the soil, while that of the northern part of Nigeria, its leaves are smaller, its growth is less or equal to 23feet, they are at times stunted as a result of low rainfall (Ayensu, 1978).

Consumption of V*ernonia amygdalina* leaf as well as its extracts can reduce high sugar level in blood; it does this by moderating glucose in the blood and thus repairs the pancreas as a result of its natural bitterness. It also regulates blood cholesterol level which is a risk factor to cardiovascular disease.There has not been enough analysis on its leaf mineral concentrates in Taraba North, hence, the purpose of this investigation of the mineral contents. (Nwaogu *et al.*, 2000).

II. MATERIALS AND METHODS

2.1 Study Setting and Design Three samples were collected in different location of Jalingo metropolitan areas which include Sabon-gari area in Jalingo metropolis, Koffai area in ATC, Ardo-kola local government and Mile 6 area of Jalingo local government, Taraba North, Nigeria.

2.2 Sample collection

A 20 g sample of bitter leaf each were collected from Sabon-gari area and marked as X, Koffai (ATC) area as Y and Z for Mile six (6) area respectively, all designated areas for samples collection were from Jalingo Local Government, Taraba North, Nigeria.

2.3 Sample preparation

Bitter leaf vegetable were cut off from the stem and washed with distilled water, then dried at room temperature 37 ^{o}C for about three days. The dried sample was blended using a local mortar and pestle, sieved using 2 mm mesh sieve to obtain fine particles.

III. RESULTS

The results of mineral content and proximate analysis of vernonia amygdalina in sample areas are below; Table one (1) Shows determination of mineral content of samples which were denoted by X, Y and Z, which represents sample locations in Sabon-gari area, Koffai (ATC) area, and Mile six (6) areas, while Table 2 represents the proximate analysis mineral screening for the samples X Y and Z respectively.

Table1 Mineral content composition of samples in (mg/100 g)

Sample code	Mn	K	Mg	Na	Ca	Cu	Fe
X= (Sabon-gari)	33.19 ±0.00	2.32 ±0.00	0.80 ±0.00	21.19 ±0.00	36.06 ±0.01	1.33 ±0.02	12.31 ±0.09
Y=(Koffai, ATC)	32.53 ±0.01	2.40 ±0.01	1.38 ±0.01	21.54 ±0.02	35.13 ±0.02	1.40 ±0.00	12.06 ±0.02
Z= (Mile 6)	31.40 ±0.00	2.60 ±0.00	1.04 ±0.01	21.41 ±0.00	35.10 ±0.01	1.43 ±0.02	13.16 ±0.03

X = Samples in Sabon-gari area
Y= Samples in Koffai area
Z= Samples in Mile six (6) area

Table 2: Proximate composition of the samples (%)±

Proximate Composition	X	Y	Z
Moisture	8.10±0.35	8.22±0.01	8.18±0.43
Crude Protein	18.60±0.26	18.84±0.01	18.30±0.16
Fat	3.30±0.15	3.45±0.013	3.32±0.16
Crude Fibre	12.93±0.30	12.41±0.01	12.02±0.32
Ash	6.10 ±0.43	7.50±0.01	6.80±0.01
Carbohydrate	37.81±0.00	38.55±0.02	37.14±0.01

± means the standard deviation for 3 replicate determination; % crude protein= N × 6.25

X = Samples in Sabon-gari area
Y= Samples in Koffai area
Z= Samples in Mile six (6) area

IV. DISCUSSION

This manuscript was designed to quantify the mineral content in vernonia amygdalina in three areas in Taraba North which include; Sabon-gari area, koffai (ATC) area and Mile six(6) all in Jalingo metropolis, Taraba North, Nigeria. Thus, Manganese content in *Vernonia amygdalina* leaf was second in the order of concentrates in mineral analyzed with 33.19 mg/100 g, 32.53 mg/100 g and 31.40 mg/100g for the three samples respectively. Potassium was 2.30 mg/100 g, 2.40 mg/100 g and 2.60 mg/100 g, the mineral is the firth in order of the concentrates analyzed. Magnesium content was 0.80 mg/100g, 1.38 mg/ 100 g and 1.04 mg/100g was found to be the lowest concentrates in the order of the analysis. Sodium content is 21.19 mg/100g, 21.54 mg/100g and 21.41 mg/100g. Sodium is the third mineral in the order of abundance. Calcium content were 36.06 mg/100g, 35.13mg/100g and 35.10 mg/100g was the highest concentrate in abundant in the analysis. Copper content were 1.33 mg/100g, 1.40 mg/100g and 1.43 mg/100g. Iron samples are 12.31 mg/100g, 12.06 mg/100g and 13.16 mg/100 g represents the fourth abundant in order of the mineral analyzed. The mineral content in a sequence of decreasing order are as follow; Ca>Mn>Na>Fe>K>Cu>Mg. Proximate analysis is in the order;Carbohydrate>Crude protein>Crude fibre>Moisture>Ash>Fat.

V. CONCLUSION

Vernonia amygdalina leafs are nutritional sources of dietary fibre, carbohydrates and crude protein but, low content in fat. Elemental analysis shows calcium to contain the highest concentration followed by Mn, K, Mg, Na, Cu and Fe. Some are essentially nutrients needed for proper functioning of the body. Hence, the leaf is safe for human consumption.

VI. ACKNOWLEDGMENT

Authors acknowledge the support of all the inhabitants of Sabon-gari area, Koffai (AT) area and Mile 6 areas, all from Jalingo metropolitan areas in Taraba North where samples were collected, and the Chemistry laboratory of Federal university wukari, Taraba State, Nigeria.

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