



**MINERAL CONTENT OF VERNONIA AMYGDALINA LEAVES (BITTER LEAF).**

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**ABSTRACT**

*Vernonia amygdalina is a leafy vegetable which is widely used as local condiments in diet. The freshly harvested Vernonia amygdalina leaves were destalked, sorted, washed with potable water, dried, milled and packed prior analysis. The mineral content of Vernonia amygdalina leaves (bitter leaf) were investigated. The mineral contents for Potassium, Calcium, Magnesium, Sodium, Zinc and Iron were  $12.25 \pm 0.21 \text{mg}/100\text{g}$ ,  $15.23 \pm 0.21 \text{mg}/100\text{g}$ ,  $23.26 \pm 0.11 \text{mg}/100\text{g}$ ,  $26 \pm 0.12 \text{mg}/100\text{g}$ ,  $15.44 \pm 0.15 \text{mg}/100\text{g}$  and  $7.45 \pm 0.24 \text{mg}/100\text{g}$  respectively. The result of the analysis showed that veronia Amygdalina could be a good source of important food nutrients.*

Keywords: *Vernonia Amygdalina*, Bitter leaf, Minerals and drying.

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**INTRODUCTION**

Vegetables are understood to mean the leafy outgrowth of plant used as foods and including those plants and parts of plants used in making soups or served, as integral parts of the main source of meal (Iniagbe, Malomo, and Adebayo 2009). They are edible parts of plant that are consumed wholly or in parts, raw or cooked as part of main dish or salad. A vegetable includes

leaves, stem, roots, flower, seeds, fruits, bulbs, tuber and fungi (Uwagbuete 1989 and Tsado 2015). Vegetables are essential components of the human diet which contain a number of nutritional important vitamins, phytochemicals and minerals (Mohammed 2014). They play an important role in maintaining general good health. Bitter leafy (*Vernonia amygdalina*) is one of the leafy vegetable that are regular ingredients in the diets of average Nigerian.

*Vernonia amygdalina* is a leafy vegetable. It is a shrub or small tree of 2-5 m with petiolate leaf of about 6mm diameter and elliptic shape. The leaves are green with a characteristics odour and a bitter taste (Khader and Rama 2003). It is widely distributed in some countries in Africa namely, Nigeria, Togo, Kenya, Cameroon, Ghana e t c (Kedng 2007). The bitter taste of *Vernonia amygdalina* is due to antinutritional factors such as alkaloids, Saponins and Tannins (Hays 1995). It is also rich in Terpenes, steroids, Flavonoid and equally has a good antioxidants property (Afolabi 2012). *Vernonia amygdalina* (Bitter leaf) is popularly consumed in many homes in Nigeria because of its nutritional, phytochemical and antioxidant properties. *Vernonia amygdalina* has been around for many years but there is inadequate scientific knowledge of its nutritional properties. Therefore the aim of this study was to estimate the mineral content of *Vernonia amygdalina*.

## **MATERIALS AND METHOD**

### **MATERIALS**

Freshly harvested *Vernonia amygdalina* leaves were obtained from the farm of the Federal Polytechnic, Ilaro, Ogun State, Nigeria. They were collected early in the morning in clean polythene bags and taken into the Food Process Engineering workshop of the Department of Food Technology, Federal Polytechnic, Ilaro, Ogun State, Nigeria for identification, authentication and processed into fine powder for analysis.

## DRYING PROCESS OF SAMPLES

The freshly harvested *Vernonia amygdalina* samples were destalked, sorted, washed with potable water to remove extraneous materials, dried at 40<sup>0</sup>C in a cabinet dryer, milled into fine powder with an Apex mill and packed into low density polyethylene film with 75 micron thickness prior analysis.

## ANALYTICAL DETERMINATION

Potassium and sodium contents of samples were determined using Jenway digital flame photometer (PF-P7 model) while the level of Calcium, Magnesium, Iron and Zinc in the samples were determine by atomic absorption spectrophotometer (Perkin-Elmal Model 403, Norwalk, CT, USA) after digestion with concentrated Nitric acid (AOAC 2005). All determinations were carried out in triplicates

Table 1 Mineral analysis of *Vernonia amygdalina*

PARAMETERS	SAMPLES (Composition (% Dry Weigh Basis))
Potassium	12.2 ± 0.11
Calcium	15.23 ± 0.21
Magnesium	23.26 ± 0.11
Sodium	26.10 ± 0.12
Zinc	15.44 ± 0.15
Iron	7.45 ± 0.25

Values are means of triplicate determination

## DISCUSSION

Minerals serve as co factor for many physiological and metabolic function (AOAC 2005). they play important role for proper tissue functioning (Khader and Rama 2003). Table 1 shows the mineral analysis of *Vernonia amygdalina*. The minerals investigated in the *Vernonia amygdalina* leaves were potassium, calcium, Magnesium, Sodium, Zinc and Iron. The potassium content of  $12.23 \pm 0.21$  mg/100g was obtained. The value was higher than  $9.50 \pm 0.12$  mg/100g reported by (Tsado 2015). Potassium is one of the most important mineral in the body. It helps regulate fluid balance, muscle contraction and nerve signal. It is very important for normal digestive and muscular function. The value of calcium was  $15.23 \pm 0.21$ mg/100g. This result was similar to the value reported by (Ejoh et al., 2007). but higher than the value of  $13.11 \pm 0.99$ mg/100g obtained by (Agomyu et al.,2016). Calcium is one of the building blocks of strong bones. It is also taken to maintain the blood level of calcium (Hardlaw and Kessel, 2002) reported that the calcium represents about 40% of all the mineral present in the body. (Lean, 2006) shows that calcium is water soluble because of its availability in the body fluid and in water. Magnesium is an active component of several enzymes (Agomuo et al., 2006). It occurs abundantly in chloroplast as a constituent of chlorophy II molecule (Mlitan 2014). It helps in Calcium metabolism in bones (Keding 2007). Magnesium helps to maintain normal nerve and muscle function, support a healthy immune system keeps the heart beat steady, and help bones remain strong. The magnesium value of *Vernonia amygdalina* was  $23.26 \pm 0.11$ mg/100g higher than what (Agomuo 2016) obtained. Sodium is a mineral that the body need to function properly. It plays a key role in the body. Sodium helps maintain normal blood pressure, supports the work of the nerves and muscles, and regulates the body's fluid balance. It is required by all life to exist. The level of sodium in *Vernonia amygdalina* was  $26.10 \pm 0.12$  mg/100g higher than the value obtained by (Agomuo 2016). (Akubugwo 2007) also reported lower value of Sodium for *A. hydridus* leaves. (Megba 2007) reported that sodium intake of less than 2g/day increase

calcium loss in urine and high intake contributes to hypertension in some people. Zinc is found in cells throughout the body. It is needed for the body's defensive (immune) system to properly work. Zinc play a role in cell division, cell growth, wound healing and the breakdown of carbohydrates. Zinc is also associated with protein metabolisms (Ihekoronye et al 1985). The level of Zinc in *Vernonia amygdalina* was  $15.44 \pm 0.15\text{mg}/100\text{g}$ . This value was higher than what was reported by Ayoola *et al.*, 2001) and the value reported by (Akubugwo 2007) for *Amaranthus hybridus*). The Iron content obtained lower than what (Agomuo 2016) reported. Iron is an essential element for blood production. Iron deficiency occurs when the body does not have enough at the mineral Iron.

## CONCLUSION

*Vernonia amygdalina* contains vital minerals of nutritional importance to the body. It can be used to fight nutritional deficiencies because of its high concentration of micronutrients such as Iron, Magnesium, Sodium and Zinc.

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