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Proximate and Mineral composition of Some Traditional Vegetables in Akwa Ibom State, Nigeria.

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Abstract- This research work was carried out to investigate the proximate and mineral composition of some traditional vegetables in Akwa Ibom State, Nigeria. These vegetables include: *Talinum triangulare, Hensia crinita, Cucurbita maxima* and *Lasianthera africana.* The vegetables were washed in potable water to remove unwanted matters and were analyzed for proximate and mineral content. All analyses were carried out in three replicates and the mean data were presented on tables using the spread sheet Microsoft Excel. *Talinum triangulare* had the highest protein content (56.72%) and moisture content (80.11%) but had the lowest content of ash (6.31%), crude fibre (2.96%) and carbohydrate (6.91%). Ash and crude fibre were present in low quantities in *Talinum triangulare*, *Hensia crinita,* and *Lasianthera africana*, except *Cucurbita maxima* which had the highest composition of ash (14.06%) and crude fibre (9.37%). Mineral composition (Potassium (K), Calcium (Ca), Magnesium (Mg) and Phosphorus (P)) was generally high in the samples although *Talinum triangulare* and *Lasianthera africana* had the lowest composition of Phosphorus. This research work has showned that these four (4) traditional vegetables are rich sources of nutrients and can contribute significantly to the nutrient requirements and health conditions of humans.

Index Terms- Cucurbita, Mineral, Proximate and Vegetables.

I. INTRODUCTION

Traditional vegetables are important items of diet in many Nigerian homes and they are valuable sources of nutrients especially in rural areas where they contribute substantially to protein, mineral, vitamins, fiber and other nutrients which are usually in short supply in daily diets (Mosha and Gaga, 1999). They have the cheapest and most abundant sources of protein (Fasuyi, 2006) and add flavor, variety, taste, color and aesthetic appeal to diet (Mepba *et al*., 2002). In Akwa Ibom State, some of the vegetables that are found include: *Heinsia crinita, Cucurbita maxima, Lasianthera africana, Pterocarpus mildbraedii, Solanum nodiflorum, Gnetum africanum, Telfairia occidentalis, Talinum triangulare, Occimum gratissimum, Vernonia amygdalina, Cannabis sativa, Abelmoschus esculentus, Curcubita pepo* etc. In Nigeria where the daily diet is dominated by starchy staples, these indigenous leafy vegetables are the most readily available sources of important micro-nutrients such as: vitamins, especially the pro-vitamin A or β-carotene (Martin, 1998) as well as essential amino acids and mineral elements. These vegetables are important commodities for poor households because their prices are relatively affordable compared with other food items. Scarcity of vegetable in the diet is a major cause of vitamin A deficiency, which causes blindness and even death in young children throughout the Arid and Semi-Arid areas of Africa (Okigbo, 1986). Thus, the objective of this work was to evaluate the nutritional (proximate and mineral) composition of some traditional vegetables in Akwa Ibom State, Nigeria.

II. MATERIALS AND METHODS

Sources of collection of Samples

The fresh vegetables (*Talinum triangulare, Cucurbita maxima, Hensia crinita* and *Lasianthera africana*) used in this research was collected from farms at Etinan, Akwa Ibom State.

Sample treatment

The fresh vegetables were air dried for one week and reduce to a coarse powdered form; about 700g was macerated with cold ethanolic extraction using 1000ml of 70% ethanol and shaken intermittently for 72 hours. It was filtered and the filtrate was concentrated (dried) *in-vacuo* at 40^0C in a water bath. The extract was weighed and stored in 100ml beaker and covered with foil paper and preserved in the refrigerator at 4^0C for the screenings.

Proximate analysis

The recommended methods of the Association of Official Analytical Chemists (AOAC, 2003) was used for the determination of moisture content, crude protein, crude fat, carbohydrate, crude fibre and ash.

Mineral analysis

Wet Digestion of Sample

For wet digestion of sample, 2 ml of the plant samples was taken in digesting glass tube. 12 ml of hydrochloric acid was added to the plant samples. The mixture was kept overnight at room temperature. 4.0 ml perchloric acid (PCA) was added to these mixtures and was kept in the fumes block for digestion. The temperature was increased gradually, starting from 50ºC and increasing up to 150ºC. The digestion was completed in about 70 - 85 minutes as indicated by the appearance of white fumes. The mixture was left to cool and the contents of the tubes were transferred to one hundred millilitres (100ml) volumetric flasks and the volumes of the contents were made to one hundred millilitres (100ml) with distilled water. The wet digested solution was transferred to plastic bottles and labelled accurately. The digest was stored and used for mineral determinations (Aregheore and Hunter, 1999; Khan, Hussain, Ashraf, Valeem, and Javed, 2005). Mineral contents: calcium (Ca), magnesium (Mg), potassium (K) and phosphorus (P) of plant samples were determined by atomic absorption spectrophotometer (AAS),

flame photometry and spectrophotometry according to the methods of AOAC (2003) and Khan, Hussain, Ashraf and Mc-Dowell (2006).

Statistical analysis

Results are reported as the means of triplicate experiments, and are presented in tables using the spread sheet software Microsoft Excel.

III. RESULTS AND DISCUSSIONS

From the results of the proximate analysis as shown on Table 1, indicated that Protein valued ranged from 56.72% - 12.83% with *Talinum triangulare* recording the highest value (56.72%) and *Hensia crinita* recording the lowest protein content (12.83%). While *Lasianthera africana* and *Cucurbita maxima* recorded 16.22% and 12.83% respectively. *Talinum triangulare* also recorded the highest moisture content (80.11%), followed by *Cucurbita maxima* (73.08%), *Lasianthera africana* (72.47%) and *Hensia crinita* (70.01%). Ash content ranged from 14.06% in *Cucurbita maxima* to 6.31% in *Talinum triangulare. Lasianthera africana* and *Hensia crinita* recorded 8.39% and 6.31% respectively. The results of the crude fibre showed that *Cucurbita maxima* (9.37%) had the highest value, followed by *Lasianthera africana* (4.93%), *Hensia crinita* (4.83%) and *Talinum triangulare* (2.96%) which showed the lowest crude fibre content. Carbohydrate composition ranged from 62.21% - 6.91% with *Hensia crinita* having the highest value and *Talinum triangulare* recording the lowest value. Eleazu and Eleazu (2013) also reported low carbohydrate composition 4.11±0.13 in *Talinum triangulare*. Lipid content was highest in *Talinum triangulare* (7.42%), *Lasianthera africana* (7.12%), *Hensia crinita* (6.22%) and *Cucurbita maxima* (2.29%) which had the lowest value.

Table 1: Proximate composition of some traditional vegetables in Akwa Ibom State, Nigeria.

PARAMETERS (%)	*Talinum triangulare*	*Hensia crinita*	*Cucurbita maxima*	*Lasianthera africana*
Protein	56.72	12.83	12.95	16.22
Moisture content	80.11	70.01	73.08	72.47
Ash	6.31	6.99	14.06	8.39
Crude fibre	2.96	4.83	9.37	4.93
Carbohydrates	6.91	62.21	61.33	59.31
Lipid	7.42	6.22	2.29	7.12

The results for the mineral analysis are shown in Table 2. Potassium (K) composition was highest in *Hensia crinita* (84.41mg/g). *Cucurbita maxima* (44.30mg/g) had the lowest value. *Talinum triangulare* and *Lasianthera africana* recorded 62.11mg/g and 56.24mg/g respectively. Calcium (Ca) composition ranged from 31.43mg/g – 24.20mg/g, with *T. triangulare* having the highest value and *H. crinita* the lowest value. Magnesium (Mg) was highest in *C. maxima* (59.99mg/g), *T. triangulare* (20.41mg/g), *L. africana* (13.99mg/g) and lowest in *H. crinita* (11.31mg/g). *H. crinita* (9.14mg/g) had the highest composition of Phosphorus (P) and *T. triangulare* had the lowest P composition 4.86mg/g. *C. maxima* and *L. africana* had 8.44mg/g and 5.00mg/g respectively. These vegetables are very rich source of nutrients which are essential for the human body.

Table 2: Mineral composition of some traditional vegetables in Akwa Ibom State, Nigeria.

Minerals (mg/g)	*Talinum triangulare*	*Hensia crinita*	*Cucurbita maxima*	*Lasianthera africana*
K	62.11	84.41	44.30	56.24
Ca	71.03	24.20	28.00	31.43
Mg	20.41	11.31	59.99	31.99
P	4.86	9.14	8.44	5.00

IV. CONCLUSION

This study showed that *Talinum triangulare, Hensia crinita, Cucurbita maxima* and *Lasianthera africana* possesses considerable amounts of proximates and mineral nutrients which are necessary for growth and maintenance of the body.

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