

## Nutritive Values of the Leaves of *Crescentia Cujete* (Ugbuba)

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### Abstract

Mineral and proximate analysis of *Crescentia Cujete* (*Ugbuba*) leaves were examined using the methods recommended by Association of Official Analytical Chemist (AOAC). The leaves contained 51.00±1.05% moisture, 2.30±0.2% ash, crude protein 51.00±0.43%, crude lipid 1.90±0.08%, crude fibre 4.00±0.12%, carbohydrates 40.40±0.02%. The minerals ranges from mg/g dry weight K(30.02 ± 0.03), Na (12.10±0.32), Ca (60.00±0.01). Mg (361.42±0.01), P(14.19 ±0.42), Mn (6.32 ± 1.01), Fe (2.43±0.01), Cu (13.04±0.10), Zn (1.20±0.43), Na/K (0.40) and Ca/P (2.14), K, Mg, Ca and Fe were found in significant concentrations. The findings showed that *Crescentia Cujete* leaves are source of nutrients for edible purpose, a good Na/K ratio for lowering blood pressure.

**Keywords:** composition, *Crescentia Cujete*, elemental analysis, mineral, nutrient, proximate

### 1. Introduction

Nutritional transition due to adaptation to junk foods was identified as one of the factors responsible for underutilization of wild leaves vegetables in urban environments of developing countries (Ganry, 2008). It is well acknowledged that some diseases such as diabetics, cancers, obesity and cardiovascular diseases are associated with inadequate consumption of fruits and vegetables. This increase in people living with diabetes is attributed to intake of refined food as symbol of well being, as substitute to locally available food minerals particularly wide vegetables leaves) which are considered as “food for the poor” are rich sources of minerals, vitamins, fibre, amino acids and antioxidants, (Itanna, 2002).

Medicinal plants have been in use for the eradication of human suffering since ancient times. In light of their therapeutic efficiency, the pharmaceutical industries started the crude extraction of medicinal plants for drugs manufacturing (Anyasor, Anna, Olushola & Aniyikaye, 2011). Phenolic compounds, flavonoids, derivatives of anthraquinone, anthocyanins, tannis, alkaloids which are secondary metabolites because of their phytochemical components present are responsible for their effectiveness. For the proximate and mineral composition, it can protect human against various diseases and ailments and affects its nutritional properties which could be used to rationlise the indigenous use of *Crescentia Cujete* as supplement. These phytochemicals present in vegetables are believed to be responsible for prevention of the above mentioned diseases (Kala & Prakash, 2006).

Calabash tree is a tropical large tree planted in temperate region and southern part of Nigeria. It belongs to the family of Bignonia ceae and it is botanically known as *Crescentia Cujete* or *Igisogba*. It is propagated by either seed or by stem cuttings. It is a tree that grows to 6m high, the leaves are simple and shaped like spatula and pointed. They are arranged in cluster around the stem. The flowers are 1 – 2 cm long and yellowish corolla, with red or purple veins arising from truck or main branch and blossom at night. It produces a large green gourd like fruit which is globulose with a smooth hard green woody shell. The fruit is up to 12 - 14 cm in diameter and takes about 5 months to mature and fall to the ground. The fruit has a white pulp and small flat seeds that are embedded in the pulp.

In herbal medicine, the fruit is used as oral anti-tumor, anti-diarrhea, a ganglioma inflammation (Minor, 2007). The fruits and leaves are used in treating fever, respiratory track complaints, hypertension, (Hassan, Mshaelia, Umar & Ogbiko, 2018). Some studies have reported the wound healing, haemostatic, anti-rheumatism, anti-bacteria, hipatoprotective, stomach ache, respiratory tract disorder, cataract as well as protection against CCl<sub>4</sub> induced liver damage (Dhawan & Gupta, 2017). The unripe fruits have been used as laxative, antipyretic and for cough. The leaves are air dried, grounded and taken as Africa tea twice daily.

The purpose of this study is to determine the nutritive values of the leaves of the nutritive values of the leaves by evaluating the proximate and mineral compositions, the Na/K and Ca/P ratio as a source of food that can lower blood pressure.

## 2. Materials and Methods

Calabash plant (leaves) were obtained from Agbor, from four different sources, were mixed to form a representative sample of the leaves which is the administrative headquarter of Ika South Local Government Area, Delta State. It is located in the Northern part of the Niger Delta, within the coordinates of latitude 6° 07'E to 6° 06'N to 6° 16 and latitude 6° 07 to 6° 12'E. They were air dried and milled to fine powder, sieved through 20mm mesh and packed in labelled sample bottles. Those for moisture determination were put in polyethylene bags to prevent loss of moisture during transportation to the laboratory. The leaves were dried at 60°C for 24 hours (Aguye, Urga, Knapp, Selmar, Omwega, Imungi & Winterhalter, 2003).

## 3. Proximate Analysis

The methods recommended by the Association of Official Analytical Chemistry (AOAC, 1990) were used for the determination of ash, crude lipid, crude fibre and nitrogen contents.

Crude protein was estimated by multiplying the values obtained for percentage nitrogen by a factor of 6.25. Five grams of fresh leaves were weighed and oven dried (Gallenkamp UK 10) at 105 °C for 24 hours and cooled in a desicator and weighted. The weight loss was expressed as percentage of moisture content.

Ash content was determined by incinerating 5 g of leaves powder in a muffle furnace (Lenton, England), at 700°C for 4 hours and its weigh expressed as percentage of ash content. Carbohydrates was estimated by subtracting, lipid, proteins, crude fibres and ash from 100% dry weight of the leaves.

Mineral analysis was done by wet digestion method using 1 g of the leaves powder with trioxonitrate (v) acid, per chloric/tetraoxo sulphate (vi) acid. Phosphorus was determined by vanado-moybdo phosphoric acid colorimeter. Sodium and potassium were determined using corning 600 flame photometer, while other metals were analysed using spectral -10 Atomic Absorption spectrophotometer.

## 4. Results and Discussion

Table 1. Proximate composition of calabash plant leaves(%)

Parameters	Concentration
Moisture contents	50.00±1.05
Ash content (% dw)	2.30±0.02
Crude protein content	51.00±0.43
Crude lipid content	1.90±0.08
Crude fibre content	4.40±0.12
Carbohydrate content	40.40±0.40

Table 2. Composition of mineral in calabash plant leaves

Mineral Element	Quality mg/100g
Potassium (K)	30.02±0.03
Sodium (Na)	12.10±0.32
Calcium (Ca)	60.00±0.10
Magnesium (Mg)	361.42±0.01
Phosphorous (P)	14.01±0.42
Manganese (Mn)	6.33±0.01
Iron (Fe)	2.43±0.01
Copper (Cu)	13.04± 0.10
Zinc	1.20±0.43
Na/K	0.40
Ca/P	2.14

Table 1 showed the proximate composition of calabash plants (leaves). It has a high moisture content of 50.00 ± 1.05 by weight which is comparable with that obtained by (Edema, Iyakoha, Oheri & Tomori & Obiole, (2000), Calvet & Locett (2002) and George, (2007). The high moisture content makes the leaves highly susceptible to microbial attack.

The ash content values were  $2.30 \pm 0.21\%$  compare with that recorded for *Selenium americium* leaves which was lower (Hassand & Umar, 2007). The ash content suggests it could provide essentials valueable and useful minerals needed for good body development. The protein content  $51.00 \pm 0.43$  indicates that the leaves could be good source of proteins. The major drawback of the use of vegetables in human nutrition is the fibre content, which often causes intestinal irritation and their low nutrient bioavailability (Kumar, 2014).

The crude lipid content  $1.90 \pm 0.08\%$  was low as most leafy vegetables have low lipid contents. But it can still serve as protein supplement (Ali, 2011). The estimated carbohydrate content was lower compared to some vegetables like *Senaobuusfolia* leaves, it is not a source of calories. The crude fibre was lower compared with *Senafolia* leaves (Aremu, Olomisaki, Otene & Atolaiye, 2005).

Table 2 showed the composition of mineral in leaves of calabash plat. The result showed that the leaves are important sources of iron, potassium ad calcium. The Iron  $2.43 \pm 0.01$  mg/g is considered significant from the 1.00mg/100g recommended daily intake (Yang, Hov, Mei & Lin, 2007). Calcium content was low  $60.00 \pm 0.10$ . Also iron deficiency is the most prevalent nutritional deficiency in human. (Lubborck, Clark & Goldman, 2004). Magnesium  $361.42 \pm 0.01$ mg/g is the second most abundant mineral present in the sample. It was about the recommended daily allowance (RDA) of 350 mg/100g. It helps in calcium metabolism in bones and is involved in prevention of circulating diseases. It is a rich source of magnesium to the body.

The zinc level is low  $1.20 \pm 0.43$  mg/g, zinc is necessary for the growth and multiplication of cells (enzymes responsible for DNA and RNA synthesis) for skin integration, bone metabolism and function taste and eye sight (Kumar, 2014). Zinc and magnesium constitute prosthetic group of enzymes in body metabolism and its deficiency can retard growth of enzymes in body metabolism and its deficiency can retard growth (Omole, 2003). Na/K ratio in the human body controls high blood pressure (Onimawo Oteno, Orokpo & Akubor, 2008). Foods with Na/K ratio less than 1 has impact of lowering blood pressure. The value of Ca/P ratio is 2.14 which is considered to be good food source, since the Ca/P ratio is above 1 and poor when Ca/P ratio is less than 0.5 mg/100g.

Copper is also an essential component of many redox enzymes, including cytochromic oxidase. It essential for the formation of haemoglobin of the red blood cells. It is required in trace quality of 900ug. Its deficiency results in anemia like symptoms.

## 5. Conclusion

The result shows that calabash plants (leaves) are good sources of protein and carbohydrates. The leaves are rich sources of magnesium needed for bone development and rich in mineral elements needed for development and rich in micro elements needed to combat disease and impact of lowering blood pressure.

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