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Proximate Composition and Mineral Contents of Ocimum Gratissimum Leaves (African Basil)

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Abstract:
The proximate composition and mineral contents of Ocimum gratissimum leaves were investigated. The freshly harvested Ocimum gratissimum leaves were de-stalked, sorted, washed with potable water, air dried at 28^{0}C for 14 days, milled into fine powder with an Apex mill and packed into low density Polyethylene film with 75-micron thickness prisor analysis. The proximate analysis showed the moisture, crude, protein, total ash, crude fiber, crude lipid and total carbohydrate contents were 10.72±0.01%, 12.98±0.10%, 10.95±0.42, 10.21±0.04%, 4.81±0.04% and 49.01±0.25% respectively. The percentage mineral contents were Potassium 79.60±0.40mg/100g, Calcium 59.14±0.41mg/100g, Magnesium 82.31±0.06mg/100g, Sodium 24.06±0.17 and Zinc 14.41±0.16. The results of the analysis showed that Ocimum gratissimum could be a good source of important food nutrients.

Keywords*: Ocimum gratissimum, proximate, minerals and drying*

1. Introduction

Ocimum gratissimum is an herbaceous plant which belongs to the family Lamiaceae [ix,viii]. It is a small shrub commonly known as scent leaf, tea bush or fewer plant. Scent leaf is commonly found around village, huts and gardens [xvi] and is called "Efirin" in South west part of Nigeria. *Ocimum gratissimum* is widely distributed in tropical and warm temperate region [xxi]. It leaves are nutrient-rich, high in minerals, vitamins, protein, fibers and other nutrients which are usually in short supply in daily diets [xix]. It is also rich in alkanoids, tannis, phytates, flavonoids and oligosaccharides [xv] It has been proved that *Ociumum gratissimum* is an effective anti-microbial [xxii]

Ocimum gratissimum is normally used as a condiment in diets because of its aromatic properties [v]. It is also very rich in volatile essential oils [vi]. Due to the strong aroma of its leave, it is used as a flavoring agent in soups and also in spicing meat products *Ocimum gratissimum* is a good antioxidant with high percentage of tannis, steroids terpenoids, and flavonoids. It is generally believed that *Ocimum gratissimum* is an underutilized plant with high minerals, vitamins, fibre and phytochemical contents that makes it nutritional important [i]. This study was carried out to provide information on the proximate composition and mineral contents of *Ocimum gratissimum* because there is inadequate scientific knowledge of its nutritional potentials.

2. Materials and Method

2.1. Materials

Fresh Freshly harvested *Ocimum gratissimum* leaves were obtained from a local farm in Ilaro, Ogun state, Nigeria. They were collected early in the morning in clean polythene bags and taken into the Food Process Engineering Workshop of Department of Food Technology, Federal Polytechnic Ilaro, Ogun state, Nigeria for identification, authentication and processing into fine powder for analysis.

2.2. Drying Process of Samples

The freshly harvested *Ocimum gratissimum* leaves were de-stalked, sorted, washed with potable water, air dried at 28^{0}C for 14 days, milled into fine powder with an Apex mill and packed into low density Polyethylene film with 75-micron thickness prior analysis

2.3. Proximate Analysis

The proximate analysis of the sample, moisture, ash and fat were determined using procedures described by [v]. The percentage Nitrogen was converted to crude protein by multiplying 6.25. The standard method by [v], were also used to determine fat and fiber contents. The carbohydrate content was calculated by the difference method. All determinations were performed in triplicates.

2.4. Mineral Analysis

The Janway digital flame photometer (PF-P7) model was used to determine the potassium and sodium contents of the samples while Atomic absorption spectrophotometric (Perkin-elmal model 403, Norwark, CT, USA) was used to determine the levels of calcium and zinc in the samples after digestion with concentrated nitric acid [v]. Potassium was determined colorimetrically using spectronic 20 (Gallenkap, uk) with KH_2PO_4 as standard.

3.Results and Discussion

PARAMETERS	COMPOSITION (% DRY WEIGHT BASIS)
Moisture	10.72±0.01
Crude protein	12.98±0.10
Total Ash	10.95±0.42
Crude Fiber	10.21±0.04
Crude Lipid	4.81±0.04
Total Carbohydrate	49.10±0.24

Table 1: Proximate Composition of Ocimum Gratissimum Leaves

Values are mean of triplicate determination.

PARAMETERS	CONCENTRATION (mg/100g)
Potassium	79.60±0.40
Calcium	59.14±0.41
Magnesium	82.31±0.06
Sodium	24.06±0.17
Zinc	14.41±0.16

Table 2: Minerals Analysis of Ocimum Gratissimum Leaves

Values are mean of triplicate determination

4.Discussion

The proximate composition of *Ocumum gratissimum* leaves are shown in table 1. The results showed that the moisture content of Ocimum gratissimum was 10.72±0.01%. The moisture content obtained was found to be slightly higher than the value of 9.10% reported by [xviii], but lower than results highlighted by [xxiii], for vernonia amyadialina. Moisture content is an index of water activity. Low moisture content of the leave indicates that the storage life can be extended. The protein content of *Ocimum gratissimum* obtained was 12.98±0.10. This value was more than what was reported by [xviii], and 3.835% reported by [x] but lower than the value of 29.78% highlighted by [viii], indicated that plant foods that provide more than 12% of their calorific value from protein have been shown to be good source of protein.*Ocimum gratissimum* is a good source of protein. The Total ash content was 10.95±0.42%. This indicates that *Ocimum gratissimum* contains high minerals. The ash content represents the mineral contents of the food materials. This value obtained for *Ocimum gratissimum* was lower than the value of 7.57 reported by [x]. for *Ocimum gratissimum*. The crude fibre of 10.21±0.4% was obtained for *Ocimum gratissimum* which was lower than the value of 11.38 reported by [x] but higher than 5.2% for s. monostrachyns [xx]. Adequate intake of dietary fiber is recommended for good health. The crude lipid value was found to be 4.81±0.04%. which was lower than 10.25 reported for *ocimum gratissimum* by [xxiii] but higher than 3.19% reported by the value obtained was similar to 4.80 reported by [ii]. The crude lipid helps to absorb and retain flavor in food. The carbohydrate content of 49.10±0.24% obtained was similar to the value reported by [xviii]. The value was however found to be very much higher than 39.05% for Amarathus curvatius as reported by [xi].

Table II shows the minerals analysis of Ocimum gratissimum leaves. It showed that potassium, calcium, magnesium sodium and zinc were present in considerable amount. It was highlighted that minerals play important roles for proper tissue functioning and that they serve as cofactero for many physiological and metabolic functions [xiii,iv]. The potassium content obtained from *Ocimum gratissimum* leaves was 79.60±0.04 which was higher than 42.74 reported by [ix] for *Mucuma flagellipes*. Potassium is an important extracellular cation which is involved in the regulation of plasma volume acid-base base, nerve and muscle contraction [iii]. Calcium in necessary for maintenance of bone, teeth and muscles [xxiv]. It represents about 40% of all minerals present in the body [xviii]. The calcium content was 59.14±0.41mg/100g. This value was higher that what [vii] reported for *Ocimum gratisimum*. Magnesium is a component of chlorophyII [xiv] and also helps in calcium metabolism in bones [xi]. The magnesium value reported by [iii] was lower than the value of 82.31±0.16mg/100gobtained for *Ocimum gratissimum*

The result showed that the sodium conted and potassium are associated in regulation of nerves and muscle irritability and are also associated with the maintained of body pH [xii]. The body also need it to function properly. It is directly involved in cell division. This mineral, zinc occurs in *Ocimum gratissimum*. The level of zinc in *Ocimum gratissium* was 14.41±1.6 mg/100g which was similar to what [xiv] reported metabolism and its involved in the functioning of immune system.

5.Conclusion

Ocimum gratissimum contains vital compounds of nutritional importance to the body. It can be used to fight nutritional deficiencies because of its high concentration of micronutrients such magnesium, sodium and zinc.

6.References

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