



Proximate Evaluation on the Various Parts of “Ede Ocha”, a Cultivar of *Xanthosoma sagittifolium* (L.) Schott Found in Anambra State, Southeastern Nigeria

Regina O Anona*, Chinelo A Ezeabara, CU Okeke and HC Chukwudi

Department of Botany, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

*Corresponding Author: Regina O Anona, Department of Botany, Nnamdi Azikiwe University, Anambra State, Awka Nigeria.

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Abstract

Cocoyam is a major source of sustenance and livelihood in Nigeria. The proximate evaluation on the corm, petiole and leaf of “Ede ocha” (white flesh) were carried out on dry matter bases using standard laboratory procedures. Test of significant was measured using the Least Significant Difference (LSD). High concentrations of moisture and carbohydrates were found in the corm. Crude fibre and fat content were detected in the petiole. Highest levels of protein and ash were present in the leaf. This study, therefore, suggested the nutritional benefits abound in the various parts of the plant.

Keywords: *Xanthosoma sagittifolium*; Corm; Crude Fibre; Carbohydrates

Introduction

Xanthosoma sagittifolium (L.) Schott popularly known as cocoyam is an herbaceous, tropical perennial monocotyledonous root plant belonging to the family *Araceae*, in the order *Arales* and the class *Liliopsida*. It is found throughout the tropics and is of economic interest in these areas [13] due to their edible cormels and corms. Cocoyam is among the six most important tuber and root crops in the world [7] and the third important staple crop after yam and cassava in Nigeria [3,4]. There has been 50-60 known species of the genus *Xanthosoma* [16] in which all cultivated varieties are presently grouped under four species: *X. sagittifolium*, *X. caracu*, *X. atrovirens* and *X. nigrum* (*X. violaceum*) [8]. However, the most locally cultivated cultivar of *X. sagittifolium* (L.) Schott present in Anambra State, Nigeria is “Ede ocha” (white flesh). They grow in habitats ranging from full sun to deeply shaded areas under the canopy of natural forests [17]. Harvest occurs during the dry season, 9-12 months after planting [14].

In Nigeria, *Xanthosoma* in its application as food is a major staple food and it is consumed in many different cultures [1]. Nutritionally, cocoyam is known to supply digestible starch [15] and significant amounts of proteins, vitamins and dietary fibre [11]. Furthermore, the major nutrient in cocoyam has been reported to have higher nutritional value over other tuber and root crops in terms of digestible protein [10]. The starchy cormels or corms of *Xanthosoma* are preferred to *Colocasia* as they are more suitable for making ‘fufu’, a traditional dish which is prepared by pound-

ing boiled tubers in a wooden mortar [12]. In addition, the leaves boiled and eaten as vegetable while the fleshy cormels or corms can either be boiled, roasted, baked, dried, ground or mashed to make a meal, snack, flour or use as traditional soup thickener.

However, this tuber crop has been widely neglected and underutilized despite the nutritional potential abound in it. Hence, the objective of this work was aimed to evaluate and compare the proximate contents in the corms, petiole and leaf of “Ede ocha” (white flesh) with the purview to postulate the nutritional contents of this plant.

Material and Methods

Sources of materials

The corms, petiole and leaf of “Ede ocha” (white flesh) were collected from a farm at Abagana, Anambra State, Nigeria in the month of October. The voucher specimen was authenticated by a Plant taxonomist Dr C. A. Ezeabara and deposited in the herbarium, Department of Botany, Nnamdi Azikiwe University, Awka, Nigeria.

Preparation of plant samples

Raw corms were peeled and sliced with a kitchen knife and were dried under room temperature alongside with the petiole and leaves for three days. The dried plant samples were ground into fine powder with the use of manual grinder (Corona, USA), stored in an air-tight container, labeled for easy identification prior to analyses.

Nutrients analyses

The moisture content of the samples was determined by gravimetric method as described by [9] while the furnace incineration gravimetric method of [2] was used to determine the ash content. The Weende method, the solvent extraction method and the Kjeldahl method as described by [9] was used to determine the crude fibre, fat and crude protein contents respectively while the carbohydrate content was calculated by difference method, as the nitrogen free extractive (NFE) [9].

Statistical analysis

The statistical analysis was done using SPSS software version 21. Data generated were subjected to analysis of variance (ANOVA). Test of significant was measured with Least Significant Difference

(LSD). The data were expressed as mean ± standard deviation of triplicate determination.

Results and Discussion

The proximate evaluation of the corm, petiole and leaf of “Ede Ocha” (white flesh) shown in table 1 revealed that high percentages of moisture and carbohydrates (37.28 ± 0.34 and 53.83 ± 0.01%) were found in the corm respectively; the petiole had the highest values of crude fibre and fat (21.67 ± 0.12% and 1.57 ± 0.06%) respectively while the highest levels of protein and ash (0.85 ± 0.06%) (15.77 ± 0.40%) were detected in the leaf. There was a significant difference in the composition of all the proximate assayed between the corm, petiole and leaf of the cultivar (p < 0.05).

% Compositions						
Plant parts	Moisture	Crude Fiber	Protein	Ash	Fat	Carbohydrate
Corm	37.28 ± 0.34c	4.8 ± 0.35a	0.31 ± 0.01a	3.4 ± 0.69a	0.39 ± 0.02a	53.83 ± 0.01c
Petiole	27.64 ± 0.28a	21.67 ± 0.12c	0.41 ± 0.17a	6.63 ± 0.06b	1.57 ± 0.06b	42.09 ± 0.01b
Leaf	31.86 ± 1.10b	10.8 ± 0.69b	0.85 ± 0.06b	15.77 ± 0.40c	0.37 ± 0.06a	40.36 ± 0.01a
P- value	0.00	0.00	0.00	0.00	0.00	0.00

Table 1: Percentage proximate compositions of the corm, petiole and leaf of “Ede Ocha”.

Results are in Mean ± Standard deviation of triplicate determinations.

Means with the same letters of alphabet in a column are not significantly difference (P > 0.05 DMRT).

Results

The findings of this study revealed that there were significant levels of nutrients present in the corm, petiole and leaf of this plant. The highest amounts of carbohydrate and moisture were found in the corm. Carbohydrates are the body’s main source of fuel as they provide energy needed for physical activity, regulate blood, build macromolecules and prevent ketosis. Crude fibre and fat were present in the petiole. The fibre content in the corms of “Ede ocha” (4.8 ± 0.35%) was greater than the fibre values of *Colocasia esculenta* var. *antiquorum* (0.65 ± 0.04%), *C. esculenta* var. *esculenta* (0.51 ± 0.02%), ‘Kochuo’ (0.50 ± 0.02%), ‘Nwine’ (0.52 ± 0.01%) and ‘Ogeriobosi’ (0.61 ± 0.06%) [6]. Fibre aids in bowel movements, lowers heart diseases, cholesterol levels and risk of cancer while crude fat helps to absorb fat soluble vitamin and serves as energy storage in the body. The high contents of protein and ash in the leaf would be of nutritional importance to developing countries; proteins are essential for building and renewal of body cells, transportation of molecules and increase the rate of chemical reactions in the body; ash indicated that many inorganic substances are present in the leaf [5].

Conclusion

Findings of this study revealed that corms, petiole and leaves of “Ede ocha” are excellent sources of carbohydrate, fibre, fat and protein hence had appreciable nutrient properties. This implied for the need for their exploitation in food production especially with regards to making of cookies, food supplements and other food directives. Furthermore, it will encourage a great level of production and consumption because of its nutritional values which is beneficial for good health.

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