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Assessment of the proximate composition of *Telfarea occidentals* and *Cucurbita pepo*

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ABSTRACT

The proximate potentials of two species of pumpkins *Telfairea occidentalis* (Hook F.) and *Cucurbita pepo* (Linn) were evaluated using standard methods of analysis. Different parts of the fruits were anlaysed. These include the seeds, seed coats, fleshly and fibrous portions. The analysis showed that the protein, lipid and calorific values were significantly higher ($p>0.01$) in the seeds than in any other portions followed by the seed coats, edible fleshy and lastly the fibrous portions. Infact both seeds are potentially very good sources of proteins and oils. The fibrous portions of both fruits have significantly higher ($p>0.01$) ash content thus suggesting higher mineral values than the other portions analysed. These fibrous portions of both fruits however have significantly lower ($p<0.05$) fat content than the other parts of the fruits. The fleshly portions contained the highest carbohydrate contents. The distribution of nutrients in both fruits indicated that the fleshly portions could be very good sources of carbohydrates. It is therefore suggestive that the current habit of discarding some portions of these fruits during consumption is unnecessary.

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INTRODUCTION

Nigeria is blessed with different types of crops whose uses and consumption patterns vary from place to place depending on cultural diversity, belief, geographical location and climatic factors. However, research into our indigenous Nigerian foods is very scanty and with the alarming rise in population and the ever escalating prices of foodstuffs, there is the need to look inwards with the aim of discovering more valuable food sources that have not been hitherto adequately exploited.

Telfairea occidentalis (Hook F.) locally know as *Ugu (*Igbo) and *Cucurbita pepo* (Linn) commonly known *Kabewa* (Hausa) both belong to the family *Cucurbitaceae*. They have been described in detail by [1-3], and are important nutritionally as soup thickeners. The young shoots, leaves and the seeds of *Telfairea* are consumed freely in the forest zone of Southern Nigeria while the fleshy and fibrous portions of the fruit are often discarded. In the North, it is the fleshy and the fibrous portions of *Cucurbita* along with the growing shoots and leaves that are eaten while the seeds are usually thrown away. The fleshy portions of *Cucurbita* fruit obtained from Sierra Leon have been reported to contain water, carbohydrates, protein, fibre, oil, minerals such as iron, phosphorus and calcium as well s vitamin C, niacin, riboflavin, thiamin and the bitter factor called *cucurbitamin* [1].

In addition, analysis of *Telfairea* green leaves [4], and that of the seed flour [5], showed that it is rich in protein, lipid and mineral elements. Since chemical analyses are good indicators of the nutritive values of foodstuffs, they can help to encourage the consumption of what is conventionally not eaten, such as the seeds of *Cucubita pepo* and the fleshy and fibrous portions of *Telfairea occidetalis.*

Therefore, the aim of this investigation was to determine the proximate composition and calorific values of the various portions of the fruits of *Telfairea* and *Cucurbita* in order to ascertain their usefulness.

MATERIALS AND METHODS

Telfairea occidentalis and *Cucurbita pepo* were purchased from Samaru market in Zaria, Kaduna State in August, 2002. The samples were separated into fleshy and fibrous portions, seed and seed coats each. They were air dried, oven dried and kept in air tight containers prior to further analyses.

The proximate composition of the various components were determined. Parameters evaluated include organic matter, ash and crude lipid which were determined by the methods described by [6]. The total nitrogen was determined by micro-kjeldahl method

where as crude protein was obtained by multiplying the total nitrogen content with a factor of 6.25. Carbohydrate was calculated by the difference method [7].

Calorific values were determined using the Alwater conversion factors [6].

RESULTS AND DISCUSSION

The results of the proximate and calorific analyses are indicated in Table 1. Generally, all portions of both fruits were high in organic matter and calories. The calorific values were high because of the combined effects of the rich carbohydrates, lipids and protein contents.

Table 1: Proximate composition and calorific values of *Telfairea occidentalis* and *Cucurbita pepo* in percentage dry matter

	Organic matter	Ash	Lipid	Crude protein	Carbohydrate	Calorific values (KJ)
Fleshy portion of *Telfairea occidentalis*	89.40 ± 2.10	10.63± 2.10	0.75 ±0.03	9.63 ±1.50	79.02 ±0.02	1517.67
Fleshy portion of *Cucurbita pepo*	94.10±1.52	5.92 ±1.52	0.97 ±0.04	8.35 ±1.20	84.78 ±3.20	1601.25
Fibrous portion of *Telfairea occidentalis*	88.70 ±2.12	11.83 ±2.13	1.28 ±0.05	11.90±1.33	75.52± 2.30	1517.04
Fibrous portion of *Cucurbita pepo*	88.43± 1.77	11.57 ±1.77	1.43 ±0.06	17.70 ±1.67	69.30 ±1.50	1515.65
Seed of *Telfairea occidentalis*	95.22± 0.88	4.78 ±0.89	42.62 ±3.53	28.90± 2.83	23.70 ±0.09	2494.72
Seed of *Cucurbita pepo*	92.90± 1.12	7.10± 1.13	47.75±5.10	35.00±2.25	10.15±0.07	2563.47
Seed Coat of *Telfairea occidentalis*	98.49±0.04	1.50±0.04	1.51±0.02	9.60±1.06	87.39±2.33	1686.51
Seed Coat of *Cucurbita pepo*	95.09±0.09	4.91±0.09	4.49±0.07	21.90±1.86	68.70±1.45	1691.08

The highest values for organic matter and carbohydrates were recorded for the seed coat of *Telfairea*, which also contains the lowest amount of ash. The ash content in the fibrous portion of *Telfairea* was significantly higher ($p < 0.05$) than the fibrous portion of *Cucurbita*. Furthermore these fibrous portions have significantly higher ($p > 0.01$) ash content than the other parts analysed. This may imply that that the fibrous portions invariably have the richest amounts of mineral elements.

The total carbohydrate content of the fleshly portion of *Cucunbita* is significantly higher ($p < 0.05$) than that of *Telfairea.* The total carbohydrate content of the fleshly portions of both fruits is significantly higher ($p > 0.01$) than the other parts of the fruits with the exception of the seed coat. This is probably responsible for the sweet and juicy taste of the fleshly parts of the fruits [2]. Nevertheless, the carbohydrate content of the seeds of *Cucurbita pepo* of 21.50% earlier reported [8] doubles the value discovered in this study. These variations could be due to both varietal, environmental as well as seasonal differences. Both the seeds of *Cucurbita* and those of *Telfairea* had the highest amounts of lipids and proteins, and hence calorific values, than any other fruit portions. This is so because the contribution to the total calorific value of any food material, by each of protein, fat and carbohydrate depends on the quantity of each of these nutrients present in the analyte material [9]. The high protein and lipid values of the seed of *Telfairea* closely agreed with those reported by earlier workers [5]. Furthermore, the protein content of *Cucurbita* seed was comparable to the value of 30 – 41% as reported for the seeds of the plant by [1]. These high protein and lipid contents of the seeds of both fruits have confirmed earlier reports by [15] that the seeds are potentially very good sources of proteins and oils.

These findings further support the reason why either the seeds or pulps (flesh and fibrous portions) of these fruits are usually consumed and that both portions of the fruits analysed have high nutrient potentials as such are consumable.

It is suggested that further analyses be conducted to determine the minerals, fatty acids and amino acids of these fruits.

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