

Variation in Proximate composition among Cultivars of Sweet Potatoes (*Ipomea Batata*)

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ABSTRACT

Proximate compositions in eight varieties of sweet potatoes were carried out. Moisture, Ash, Fat, Crude fibre, Crude protein, Carbohydrate of the crushed sample were determine using standard procedures. The results showed that the ash composition were significantly ($P<0.01$) difference among the eight varieties with the highest value obtained from CPI-Tanzania ($3.16\pm 0.013\%$) and least value in Tis-253 ($2.44\pm 0.026\%$). Dry matter content also showed highest content value in wagabalise ($33.06\pm 0.024\%$) and least in Tis-8441 ($27.06\pm 0.019\%$). Moisture content also showed significant difference among the eight varieties ($P<0.01$) with the highest moisture content value obtained from Ex-Igbariam ($73.40\pm 0.013\%$) and least concentration in wagabalise ($66.94\pm 0.035\%$). Crude protein, crude fiber, crude fat and carbohydrate has no significance ($p<0.01$) difference among the varieties. The results of this study indicated that eight varieties of sweet potato studied contain high enough proximate composition values.

Keywords: Sweet potatoes, moisture content, ash, fat, crude fibre, crude protein, carbohydrate.

INTRODUCTION

Sweet potato (*Ipomea Batata*) is root vegetable that has yellow orange flesh and thin skin that is white, yellow, orange, red or purple in colour. It is rich in nutrients. They are perennial through root system. Sweet potato is popular and prevalent within Abakaliki agro ecological zone of Ebonyi State Nigeria where it is called "Ogogo". They are consumed boiled, roasted and fried. *Ipomea Batata* has a regulatory property because of its content of carotenoids [1].

Sweet potatos are rich in food constituent such as carbohydrate, crude protein, moisture, crude fiber and crude fat [2]. The determination of these food compositions is fundamental to theoretical and applied investigations in food science and technology. This is because it is the basis for determination of the nutritional values and overall acceptance of food from consumers stand point [3].

MATERIALS AND METHODS

Plant Materials: The materials used for this research project were eight varieties of sweet potatoes (*Ipomoea batata*). They includes: TIS-86/0356, TIS -8164, EX-Igbariam, TIS-253, TIS-8441, TIS-87/0087, CPI-Tazanian, Wagabalise.

Processing of Plant Materials: Before analysis, preprocessing of the samples was done as follows: The samples were peeled, washed and 50.0g of each sample were weighed with weighing

balance. Then these were crushed into slurry form prior to the analysis

Method of Analysis: Methods describe by Pearson 1976 and James 1995 was used to determine moisture, fats, crude fibre, and crude protein. The total carbohydrate content was determined by the difference method as reported by [4] while total ash was determined by the furnace incineration gravimetric method [5].

RESULTS AND DISCUSSION

The results of the compositional analysis of sweet potato varieties studied are presented in Figures 1 - 7. The results showed that, in all instances, moisture was the highest

constituent followed by dry matter, while crude fibre content was the least. Analysis of variance indicated highly significance among the cultivars in the mean crude protein, moisture, ash, dry

matter, carbohydrate, fibre and fats contents.

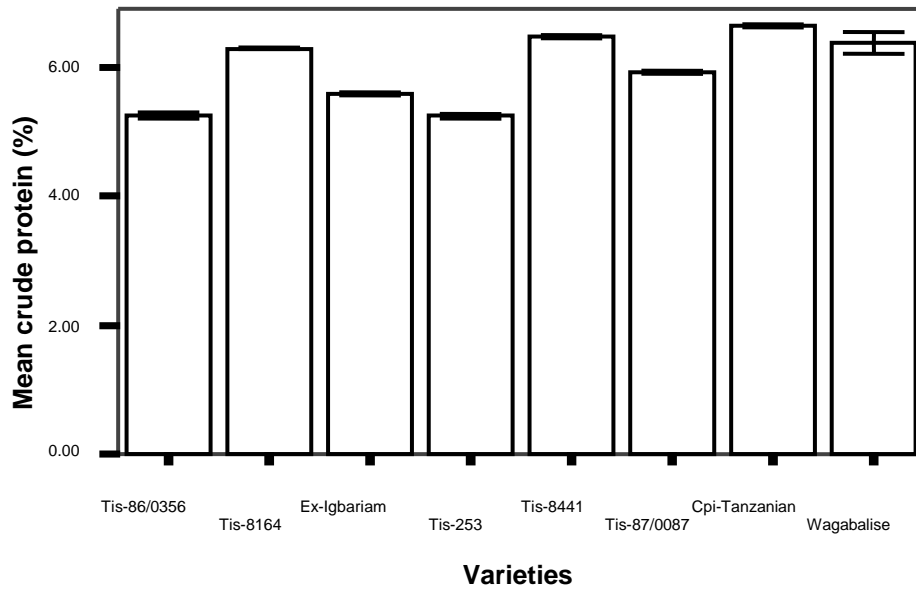


Fig. 1: Concentration of crude protein (%) in the various sweet potato varieties

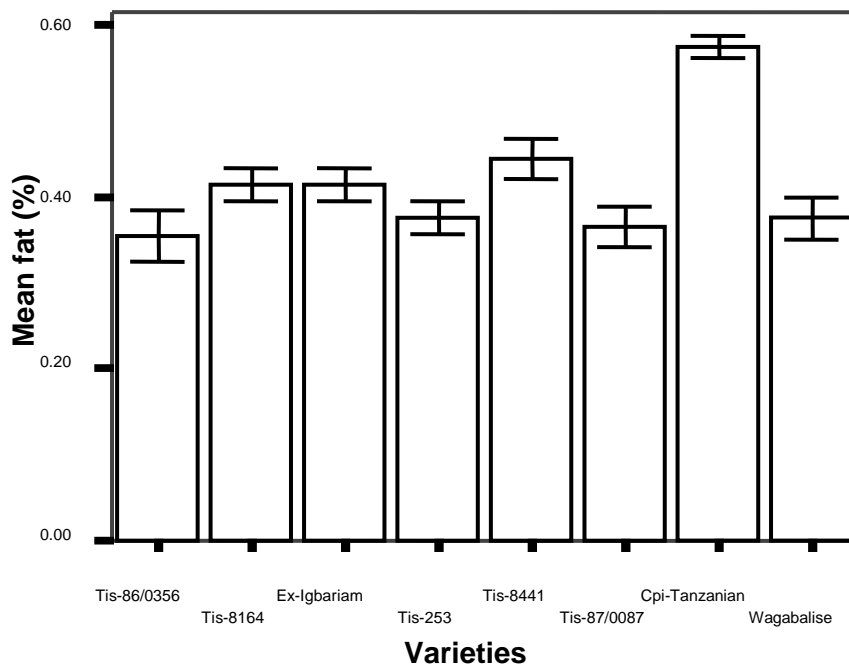


Fig. 2: Concentration of fat (%) in the various sweet potato varieties

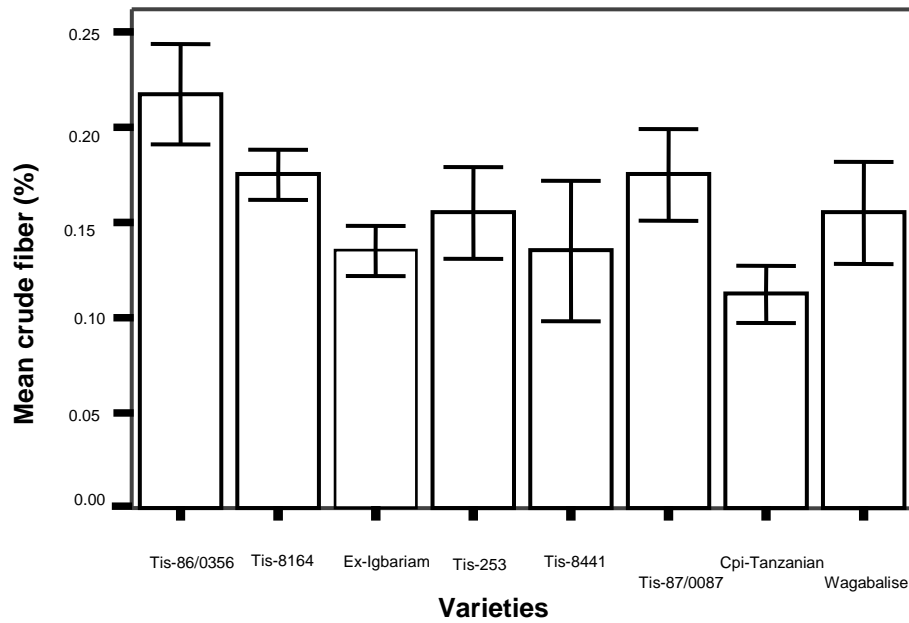


Fig. 3: Concentration of crude fibre (%) in the various sweet potato varieties

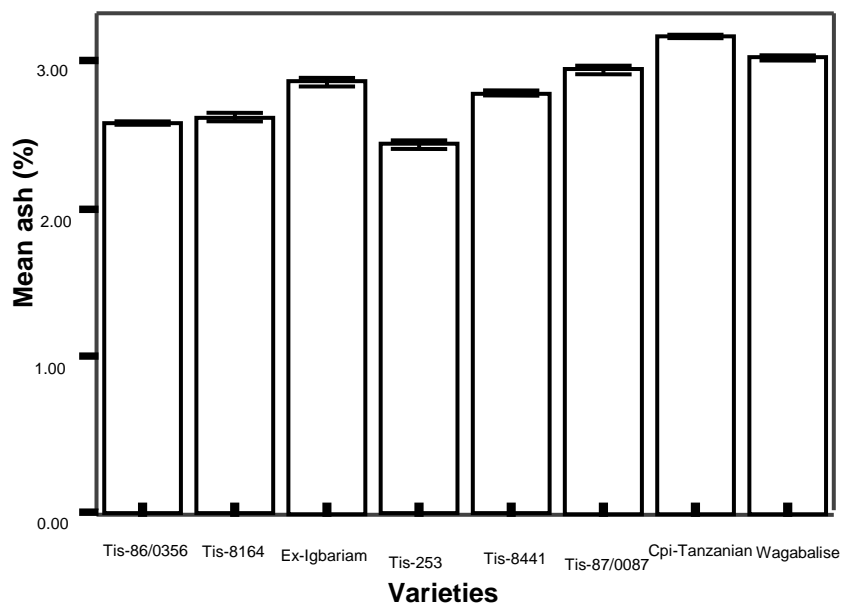


Fig. 4: Concentration of ash (%) in the various sweet potato varieties

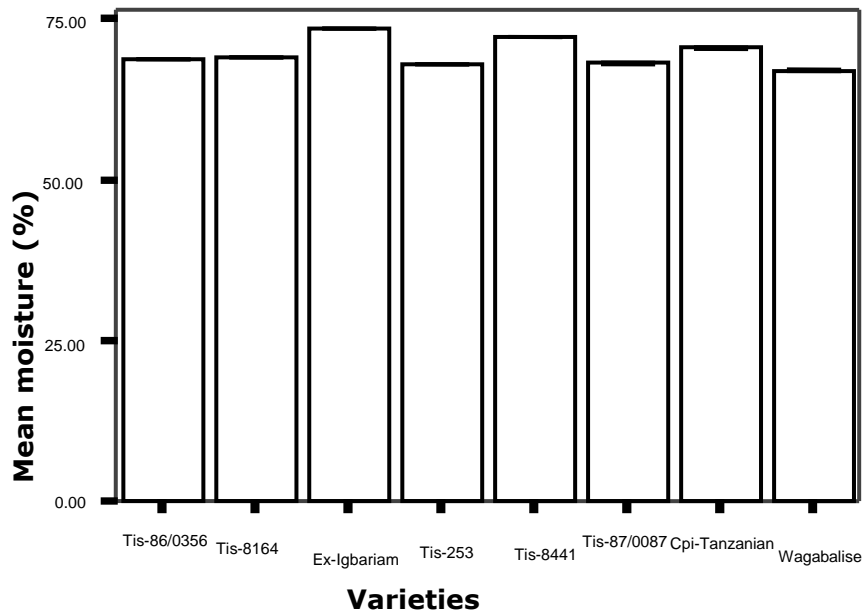


Fig. 5: Concentration of moisture (%) in the various sweet potato varieties

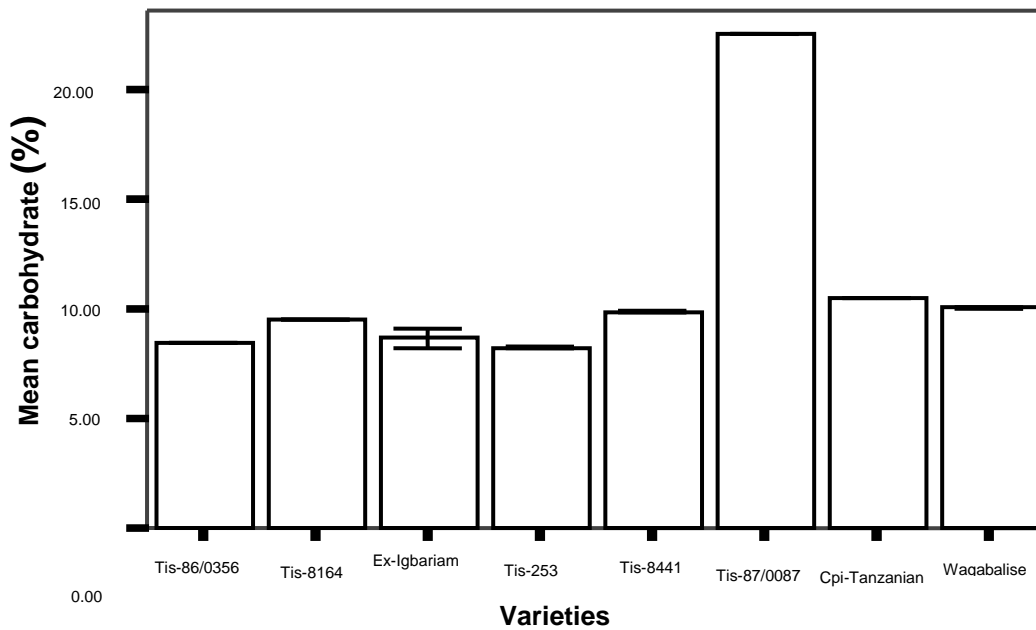


Fig. 6: Concentration of carbohydrate (%) in the various sweet potato varieties

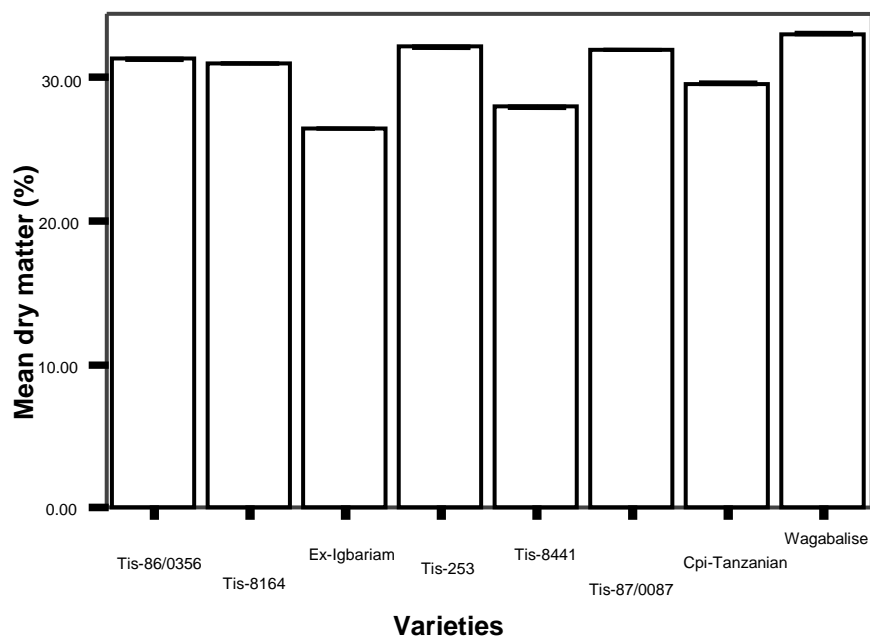


Fig. 7: Concentration of dry matter (%) in the various sweet potato varieties

The result obtained from the study showed that the values of moisture and dry matter were low when compared to the values obtained by [6] using sweet potato varieties. The values obtained in this present research were far below the values obtained by [7] [8]. This implies that these varieties of sweet potato can be stored for short period without spoilage. However, the values obtained are high when compared to the value (0.99%) recorded by [9].

The crude fibre was found to be high in TIS-86/0356 with value of $0.22 \pm 0.026\%$ followed by TIS-8164 and TIS-87/0087 with values of $0.18 \pm 0.019\%$ and 0.18 ± 0.024 respectively and this is low when compared to the value ($11.19 \pm 0.30\%$) obtained by [10] using sweet potato. Though crude fibre does not contribute to nutrients or energy, it is essential for good bowel movement, help in preventing obesity, diabetes and colon cancer and other ailments of the gastro intestinal tract of man [11].

Crude protein was highest in CPI-Tanzanian with value of $6.65 \pm 0.030\%$ followed by TIS- 8441 with value of $6.48 \pm 0.030\%$. These values were high when compared to the value of 0.054% obtained by [12] and also the value

obtained was still high when compared with value obtained by [13] using sweet potato. This implies that the sweet potato varieties studied are good source of nutrients because they are rich in protein.

For crude fat, CPI- Tanzanian has the highest value of $0.58 \pm 0.013\%$ followed by $0.45 \pm 0.024\%$ in TIS-8441 respectively, and the values obtained were lower than the value of 4.7% obtained by [14]. The low fat content of sweet potatoes indicates that the tuber can be stored for long periods at right temperature and moisture without spoilage by rancidity [15]. Also, the low fat content of this sweet potato is nutritionally important since high fat intakes are associated with increased risk of colon cancer, breast and prostate cancer [16]; [17]. For ash content, the highest concentration was CPI-Tanzanian followed by Wagabalise with values of $3.16 \pm 0.13\%$ and $3.02 \pm 0.017\%$ and this is low when compared to the value of 12.89% obtained by [18].

Carbohydrate was found to be highest in TIS-87/0087 with value of $22.53 \pm 0.019\%$ followed by CPI-Tanzanian with value of $10.51 \pm 0.013\%$ and this value was high when compared

to the value (0.185%) obtained by [11]. This shows that these varieties of sweet

potato under study are good sources of carbohydrate.

CONCLUSION

This study showed that sweet potato (*Ipomea Batata*) showed variation in the composition of crude protein, carbohydrate, ash, moisture, fat, crude

fiber among the eight varieties. These indicate that the sweet potato under study are good source of nutrients.

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