

Research Article

Comparison of Nutritive Values of the Leaves and Stems of Long - Fruited Jute (Corchorus Olitorius) and Local Garden Egg (Solanum Macrocarpon)

Kadiri Daniel

Department of Science Laboratory Technology, Auchi Polytechnic, Auchi , Edo State, Nigeria

Phone Number: +2348060930201

E-mail: michaelohigbamududele@yahoo.com

Accepted on December 01, 2014

Abstract: Proximate analysis of the leaves and stems of long-fruited jute (Ewedu) and local garden egg (Igbagba) was carried out. The protein content of the leaves samples ranges between 24.14±0.20% to 29.85± 0.22% while that of the stem ranges between 20.96 ±0.11% to 40.00±1.07%. Dry matter content of leaves ranges between 92.21 ± 0.05% to 95.46 ± 0.44% while that of the stem ranges 92.23±0.24% to 94.38± 1.10%. Ash content of the leaves is between 10.75±0.04 to 19.26± 0.16 while that of the stem is 15.15±0.01% to 16.06 ± 0.31%. Fibre content of the leaves is between 6.64±0.01 to 18.51 ± 0.01% while that of the stem ranges between 20.47± 0.01% to 22.50 ± 0.01%. Fat content of the leaves is between 13.96 ± 0.01% to 14.81 ± 0.01% while that of stem is between 14.02±0.01% to 15.36 ± 0.01%. Carbohydrate content of leaves ranges between 9.78±0.17 % to 39.57 ±0.06%. Mineral analysis of the leaves and stems shows that they contained good and high amount of nutritionally valuable elements like Fe, Ca, Na, P, Mg, K, and Zn.

Keywords: Proximate, analysis, protein content, fibre, moisture content.

Introduction

Vegetables

Vegetables can be defined as leafy outgrowth of plants which can be consumed in relatively small quantities as a side dish or a relish with a staple food. They form the largest group of plants consumed by man, and this group is also the most heterogeneous. They are derived from the families of flowering plant and also from algae and fungi. The vegetable maybe the swollen tap roots (e.g carrot, the lycopoty). It can also be the part below the cotyledon, (e.g water leaf), the fruit e.g tomatoes, the flower bud (e.g. globe artiochoke) and exceptionally the whole plants, as in the case of seedlings of some cereals and pulse. Vegetables are plants which are served with or incorporated into a wide range of dishes to add interest; variety, nutritional value, colour and texture and so contribute much to an enjoyable meal. Most vegetables are leaves, roots and stems of herbaceous plants, although flowers, calyces, Immature seeds or fruits may also be consumed as vegetables. Nutritionally vegetables are good sources of vitamin B, protein, minerals, fibre. The ideal soils for most vegetables are the medium clay loam but these have to be

properly used and well supplied with both nutrients and organic matter in order to retain their fertility (Rice and Tindall, 1987). The lipids occur in the cytoplasm mitochondria and cell membrane and appear to be necessary for the proper structure and functioning of cells (Roborts, 1976). The elements present in the most naturally occurring protein are carbon 59%, hydrogen 7%, oxygen 23%, nitrogen 16% and sulphur 0.3%. (Thekoronye and Ngoddy, 1985). Vegetables are good sources of minerals, protein, lipid (fat) and vitamins. Minerals are essentials as constituents of the bones and teeth (Ca, P, Mn) as soluble salt which help to control the composition of the body fluids and cells (K, Mg, P). Leafy vegetables are sources of vitamins in the tropics. (okodide, 1990).

Materials & Methods

Fresh vegetables were collected from Federal University of Akure (FUTA), Ondo state, Nigeria. Two vegetables were analyzed in which the leaves and stems were collected. The leaves and the stems were analysed separately making samples to be four in number. The vegetables were collected and sun dried for six days. The derived samples were then brought into the laboratory for analysis, the leaves were ground to fine state and kept in a polythene bag with label for analysis. The same was done to the stems of all the samples. Determination of proximate composition and mineral elements components of these samples were carried out with specific standard analytical procedures Data were presented as means three replicates (±), standard deviation (SD). One way analysis of variation (ANOVA and Duncan multiple range test were carried with SPSS version 16 software significance was accepted P>0.05.

Result & Discussion

Table (1) shows the proximate composition of leaves and stems of the two vegetables. An observation of table (1) showed that the result are slightly agreement with that given by oshodi (1992), who put protein content of dried samples as ranging between 36.89 in igbagba (solanum macrocapum) to 35.42 in ewedu (corchorus olitorius). The

moisture contents are low both in the leaves and the stem of the plants, but the stems are higher than the leaves. The samples have generally slightly high fat content which ranges between $13.96 \pm 0.01\%$ to $15.36 \pm 0.01\%$. Thus, consuming vegetables will not likely cause obesity but provide enough heat to the body. They also have high fibre content which ranges between $6.64 \pm 0.01\%$ to $22.50 \pm 0.01\%$. High amount of crude fibre in the sample help in peristaltic movement of the bowel which cause easy digestion and bring about release to bowel. This is

one of the reasons why a lot of people consume vegetables. The ash content are high, thus indicate high mineral content of the samples. This was supported by result obtained in table (II) Local garden egg has the highest ash content, but the product ranges between $10.75 \pm 0.04\%$ to $19.26 \pm 0.16\%$ Carbohydrate is a source of energy, all the result are high except in local garden egg, the protein contents are high in both the leaves and the stems of the samples.

Table I: Proximate Data for Leaves and Stems of Vegetable

| PROXIMATE ANALYSIS | LONG-FRUITED JUTE | | LOCAL GARDEN EGG | |
|--------------------|-------------------|------------------|------------------|------------------|
| | LEAVES | STEM | LEAVES | STEM |
| % MOISTURE | 4.54 ± 0.05 | 7.77 ± 0.24 | 7.79 ± 0.44 | 5.62 ± 1.10 |
| % CRUDE PROTEIN | 24.14 ± 0.21 | 20.96 ± 0.11 | 29.85 ± 0.22 | 40.00 ± 1.07 |
| % ASH | 10.75 ± 0.04 | 15.15 ± 0.01 | 19.26 ± 0.16 | 16.06 ± 0.31 |
| % FIBRE CONTENT | 6.64 ± 0.01 | 22.50 ± 0.01 | 18.51 ± 0.01 | 20.47 ± 0.01 |
| % FAT | 13.96 ± 0.01 | 15.36 ± 0.01 | 14.81 ± 0.01 | 14.02 ± 0.01 |
| % CARBOHYDRATE | 39.57 ± 0.06 | 18.26 ± 0.08 | 9.78 ± 0.17 | 3.83 ± 0.50 |
| % DRY MATTER | 95.46 ± 0.44 | 92.23 ± 0.24 | 92.21 ± 0.05 | 94.38 ± 1.10 |

From the table, potassium in the stem is higher concentrated ranging between $1.72 \pm 0.05\%$ to 4.90 ± 0.14 potassium keeps vegetables healthy and more resistant to disease. Calcium shows a clear-cut trend with the stems. Magnesium and phosphorus were present to lower concentration than other metals. Phosphorous is very low in all the samples, the value of phosphorous are in good agreement with those of oshodi (1992) who reported 0.35 for Ewedu and 0.36 for Igbagba. The values obtained for

Fe and Zn were present at high concentrations in both the leaves and the stems. Thus eating vegetables will bring out increase in ones blood level. The differences in the value obtained for the samples could be due, partly to their source (sai and tindall 1976), or the land where they are harvested from. Finally, an observation of table (I) and table (II) shows that there is little variation in the nutritive values obtained for both stems and leaves in all samples.

Table II: Some Nutritional Metals on the Leaves and Stem

| | LONG-FRUITED JUTE | | LOCAL GARDEN EGG | |
|----|-------------------|-----------------|------------------|-----------------|
| | LEAVE | STEM | LEAVE | STEM |
| Na | 1.03 ± 0.06 | 0.64 ± 0.40 | 1.81 ± 0.14 | 1.74 ± 0.12 |
| K | 1.72 ± 0.05 | 4.88 ± 0.13 | 4.90 ± 0.14 | 3.98 ± 0.10 |
| P | 0.11 ± 0.16 | 0.30 ± 0.13 | 0.32 ± 0.01 | 0.11 ± 0.16 |
| Ca | 0.18 ± 0.01 | 0.08 ± 0.01 | 0.11 ± 0.02 | 0.18 ± 0.02 |
| Mg | 0.18 ± 0.03 | 0.12 ± 0.02 | 0.12 ± 0.01 | 0.16 ± 0.01 |
| Fe | 4.72 ± 0.01 | 4.87 ± 0.03 | 5.82 ± 0.12 | 8.41 ± 0.10 |
| Zn | 2.79 ± 0.02 | 3.15 ± 0.01 | 2.60 ± 0.05 | 3.10 ± 0.02 |

Conclusion

The two vegetable leaves & stems analyzed show that, they are very nutritive and possess mineral that are useful to mankind. They can supply the minerals that are necessary for the development of the body. The combination of both leaves and stems will be of good to consume, since the stem too is very nutritious.

References

1. Abbiw, D (1990) useful plants of Ghana, Kew Botanic Gardens, Kew UK, 337PP.
2. Aletor, V.A and Fasuyi, A.O (1997). Nutritional composition and processing effect on cassava leaf (*Manihot esculenta* cranzii) antinutrients. Proceeding of 2nd annual conference. Animal Science Association of Nigeria, Lagos. September 16-17 PP 231-242.
3. Association of Official Analytical chemist (1995). Official Methods of analysis (15th edition), Washington D.C. PP 125-898.
4. Association of Official Analytical Chemist (AOAC), (2002), Official methods of analysis (17th edition), Washington, D.C. USA.
5. Ayodeji .O. Fasuyi (2006). Bio nutritional evaluation of three tropical leaf vegetables (*Telferia occidentalis*, *Amarantus cruentus* and *Talinum Triangulare*) as sole dietary protein source in rat assay.
6. Biggs, A.G and Foradham, R. (1985)- principle of vegetable crop production. Macmillan press limited. Fernema, O.R. Food Chemistry 3rd edition, New York 1996, PP 365-424.
7. Georglerskil ,V.I. Annenkov, B.N. and Samokling, V.I. (1982) mineral nutrition of animal Butterworths. Mudambi, S.R. and Rajajopal, M.O. (1992), fundamental of foods and nutrition, second edition. Wiley Eastern limited.
8. Oke O.L. (1975), A case of vegetable protein in developing Countries World Review of Nutrition and Diatetics 23, 259-263.
9. Oshodi, A.A. (1992), Comparison of protein, Mineral and Vitamin C contents of Dried leafy vegetables packj. Science Resp. vol. 35 page 265-266.
10. Pearson, D. (1979) Chemical Analysis of foods (7th edition) J.A.Churchill London, UK. Tindall H.D. (1983), vegetables in tropics. Macmillan press Ltd.