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Chemical Composition of Three Traditional Vegetables in Nigeria

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Abstract: This work was carried out to evaluate the nutritional composition of three traditional vegetables in Iree, Osun State. The leafy vegetables used were *Cnidoscolus chayamansa* (iyana ipaja), *Solanium nodiflorum* (Ogumo), and *Senecio biafrae* (worowo). The vegetables were washed in potable water to remove unwanted matters and were analyzed for proximate and mineral All analyses were carried out in three replicates and the data were evaluated for significant differences in their means with Analysis of Variance (ANOVA) ($p \leq 0.05$). *Cnidoscolus chayamansa* had higher protein content (5.91%) and carbohydrate content (8.88%) but there was no significant difference ($p \geq 0.05$) in the crude fibre value and that of *Senecio biafrae*. *Senecio biafrae* had higher moisture content (89%) while *Solanium nodiflorum* had higher ash and fat content which were significantly different ($p \leq 0.05$) from the other vegetables. *Cnidoscolus chayamansa* had higher values in all the mineral contents determined and these were significantly different ($p \leq 0.05$) from other vegetable. There were no significant difference ($p \geq 0.05$) in potassium, calcium and iron contents of *Solanium nodiflorum* and *Senecio biafrae*. The three vegetables are good sources of nutrients which could be consumed for normal growth.

Key words: Traditional vegetable, *Cnidoscolus chayamansa*, *Solanium nodiflorum*, Senecio biafrae

INTRODUCTION

Leafy vegetables are important items of diet in many Nigerian homes and they are valuable sources of nutrients especially in rural areas where they contribute substantially to protein, mineral, vitamins, fiber and other nutrients which are usually in short supply in daily diets (Mosha and Gaga, 1999). They have the cheapest and most abundant sources of protein (Fasuyi, 2006) and add flavor, variety, taste, color and aesthetic appeal to diet (Mepba *et al*., 2002). In Nigeria and many Africa countries of the tropics; vegetables are very abundant immediately after the rains but becomes scarce late in rainy season and more so in dry season (Ihekoronye and Ngoddy, 1985). Among the traditional vegetables in Nigeria are *Solanium nigrum*, *Solanium nodiflorum*, *Senecio biafrae*, *Crassocephanum crepidiodes*, *Talinium triangulare Celosia orgentea* and *Vemonia amygdalia*. Most of these vegetables are consumed in the rural areas or in the communities where they are being planted. They are underutilized when compared to the introduced varieties due to the flavour and unfamiliar taste impacted on the food (Okeno *et al*., 2003; Orech *et al*., 2005; Smith and Eyzaguirre, 2007). Scarcity of vegetable in the diet is a major cause of vitamin A deficiency, which causes blindness and even death in young children throughout the Arid and Semi-Arid areas of Africa (Okigbo, 1986). African leafy vegetables play a highly significant role in food security of the underprivileged in both urban and rural setting and are also vital for income generation (Orech *et al*., 2005). The objective of this work was to evaluate the nutritional composition of three traditional vegetables in Nigeria.

MATERIALS AND METHODS

Three traditional vegetables (*Cnidoscolus chayamansa*, *Solanium nodiflorum* and *Senecio biafrae*) were collected fresh from the farm at Iree, Osun State. The vegetables were washed in potable water to remove unwanted matters and were analyzed for proximate and mineral composition. The method of AOAC (1990) was used for the proximate analysis while the method of Novozamsky *et al*. (1983) was used for mineral determination. All analyses were carried out in three replicates and the data were evaluated for significant differences in their means with Analysis of Variance (ANOVA) ($p \leq 0.05$). Differences between the means were separated using turkey's test as packaged by SPSS 11.0 software.

RESULTS AND DISCUSSION

The results of proximate compositions of the vegetables are shown in Table 1. Protein content ranged from 3.03-5.91%. *Cnidoscolus chayamansa* had higher protein content (5.91%) which was significantly different ($p \leq 0.05$) from the other two samples. Crude protein contents ranging from 27.17-28.93% (dry basis) was recorded by Dairo and Adanlawo (2007) for *Senecio biafrae* and *Crassophacelus crediode* vegetables. Kuti and Torres (1996) also observed protein content of 5.71% (wet basis) for *Cnidoscolus chayamansa* vegetable and 11.6-12.3% (dry basis) for two varieties of *Senecio biafrae* vegetables (Adebooye, 2000). Fasuyi (2006) reported crude protein (19.9-35.1 g/kg), crude

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Table 1: Proximate composition (wet basis) of three traditional vegetables in Nigeria

Composition (%)	*Cnidoscolus chayamansa*	*Solanium nodiflorum*	*Senecio biafrae*
Protein	5.91a	3.31b	3.03c
Moisture content	82.00c	85.00b	89.00a
Ash content	1.57c	2.67a	2.01b
Crude fibre	0.92a	0.78b	0.92a
Fat content	0.72b	0.87a	0.61c
Carbohydrate	8.88a	7.37b	4.43c

Mean values followed by the same letter down the column were not significantly different ($p \leq 0.05$)

Table 2: Mineral composition of three leafy vegetables in Nigeria

Mineral content	*Cnidoscolus chayamansa*	*Solanium nodiflorum*	*Senecio biafrae*
K %	4.02a	0.19b	0.18b
Ca %	2.76a	0.41b	0.38b
Mg %	1.11a	0.33b	0.25c
Na ppm	116.26a	28.43b	26.08c
Fe ppm	21.06a	16.38b	16.03b
Mn ppm	19.32a	11.63b	11.11c
Zn ppm	8.53a	4.88b	3.95c
Cu ppm	0.78a	0.55b	0.45c

Mean values followed by the same letter down the column were not significantly different ($p \leq 0.05$)

fibre (8.8-12.7 g/kg), ether extract (fat) (5.4-29.2 g/kg) and ash contents of 10.9-19.4 g/kg on dry basis for three vegetable species (*Talium triangulare, Amaranthus cruentus and Telfairia occidentalis*). Carbohydrate content ranged from 4.43-8.88%. *Cnidoscolus chayamansa* had higher value while the least value was in *Senecio biafrae* but there were no significant differences ($p \leq 0.05$) in the crude fibre value of *Cnidoscolus chayamansa* and that of *Senecio biafrae*. Crude fibre content of 1.9% was recorded for *Cnidoscolus chayamansa* (Kuti and Torres, 1996), the value obtained was lower than this value. This may be due to the location, varieties, maturity of the vegetable and the cultural practices adopted during planting. *Senecio biafrae* had higher moisture content of 89% and the least value was in *Cnidoscolus chayamansa*. Higher moisture content of *Senecio biafrae* makes the vegetable easily susceptible to deterioration. *Solanium nodiflorum* had higher ash and fat content which were significantly different ($p \leq 0.05$) from the other vegetables. The mineral compositions are shown in Table 2. In all the mineral content analyzed, *Cnidoscolus chayamansa* had higher values which were significantly different ($p \leq 0.05$) from other vegetable. This agrees with the findings of Kuti and Torres (1996) and Booth *et al.* (1992) that chaya leaf have high mineral contents. There were no significant difference ($p \leq 0.05$) in potassium, calcium and iron contents of *Solanium nodiflorum* and *Senecio biafrae*. *Senecio biafrae* had lower values in Mg, Na, Mn, Zn and Cu. The three vegetables are good sources of nutrients which could be consumed for normal growth.

Conclusion: This study evaluates the chemical compositions of three vegetables in Nigeria. The three vegetables examined contain appreciable amount nutrients and are good source of roughages.

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