International Journal of Development and Sustainability
Online ISSN: 2186-8662 – www.isdsnet.com/ijds
Volume 1 Number 3 (2012): Pages 634-643
ISDS Article ID: IJDS12091801

Special Issue: Development and Sustainability in Africa – Part 1

The underutilized vegetable plants of the federal capital territory (FCT) Abuja of Nigeria

S. Abubakar [1*], G.H. Ogbadu [1], A.B. Usman [1], O. Segun [2], O. Olorode [2], I.U. Samirah [3]

[1] *Biotechnology and Genetic Engineering Advanced Laboratory, Sheda Science and Technology Complex, P.M.B. 186, Garki, Abuja FCT, Nigeria*
[2] *Department of Biological Science University of Abuja P.M.B 117. Abuja FCT, Nigeria*
[3] *Department of biological science F.C.E. Zuba, P.M.B. 61. Garki, Abuja, Nigeria.*

Abstract

Promotion and conservation of underutilized indigenous vegetable plants for healthy diet, income generation and food security are the main aims of this ecological survey. Sixty species of flowering plants underutilized as vegetables were collected from the field in the Federal Capital Territory (FCT), across all the six area councils). The family *Fabaceae* has the highest number of species followed by *Asteraceae.* Thirty four (56.7%), of the vegetables are herbs, twenty (33.3%) are trees, while six (10%) species are shrubs. The predominant modes of propagation among the plants are by seeds, followed by stem cutting and of course few are by underground parts of the plants. Seventy percent (70%) of the underutilized vegetables collected are wild, while thirty percent (30%) are less cultivated. Though these underutilized vegetables abound in FCT environment, only eight percent (8%) are sometimes seen in the markets. Some of the underutilized vegetables collected plants viz, *Annona senegalensis, Vernonia amygdalina and, Leptadenia hastata* to mentioned but a few, are also claimed to be of medicinal importance.

Keywords: Vegetable plants, Underutilized, Flowering plants, Herbs, Trees, Federal Capital Territory (FCT)

***Cite this paper as*:** Abubakar, S., Ogbadu, G.H., Usman, A.B, Segun, O., Olorode, O. and Samirah, I.U. (2012), "The underutilized vegetable plants of the federal capital territory (FCT) Abuja of Nigeria", *International Journal of Development and Sustainability,* Vol. 1 No. 3, pp. 634-643.

[*] Corresponding author. *E-mail address:* salisuabubakar99@yahoo.com

1. Introduction

Vegetable can be defined as usually succulent plant or portion of a plant which is consumed as a side dish, with a starchy staple, grain or tuber/root (Grubben et al., 1994). The definition of vegetables by FAOSTAT (1999, 2007), are 70-95% water, in which generally are low in dry matter and nutrients, often contain minerals and vitamins that are partly lost in cooking, and often a large portion of the commodity (tops, peel, etc.) is discarded during preparation.

The nutritional content of vegetables varies considerably, though generally they contain little protein or fat (Woodruff, 1995; Whitaker, 2001)and varying proportions of vitamins such as Vitamin A, Vitamin C, Vitamin K and Vitamin B6, provitamins, dietary minerals and carbohydrates. Vegetables contain a great variety of other phytochemicals, some of which have been claimed to have antioxidant, antibacterial, antifungal, antiviral and anticarcinogenic properties (Gruda, 2005; Steinmetz and Potter, 1996).

Plants that serve as vegetables may be cultivated, semi-cultivated or uncultivated (Wild). Those ones that are cultivated or semi-cultivated may be grown in homes, gardens or intercropped with other crops. Though vegetables are known to be integral parts of various region of Nigeria, an insignificant proportion of our indigenous vegetable species are cultivated, most of them remain as wild species (Dentox and Ojeifo, 1993).

For many years, the vegetable crops that have enjoyed much attention are the exotic ones (these include *Lucopercicum esculentum,* and some species of *Solanum spp, Caspicum spp* etc.). A vast majority of the indigenous vegetable plant species of the same or much better potential nutritional values are in the wild as neglected and under-utilized. A lot of the neglected vegetable species in our savannah and forest zones are also endowed with other by product(s) (secondary or primary) that may be of great importance to human race directly or indirectly in the ecosystem. Markets survey of our urban cities to see the vegetables that are always harvested for sale will show the degree of neglect the wild ones (innumerable vegetable alternatives) have suffered. A plant that has an obscure niche to the plant users clearly appears to be on the fast lane to extinction.

The survey is meant to highlight the abundant indigenous underutilize vegetables in FCT of Nigeria and its environs, and also to serve as a tool for alleviating the difficulty in getting these indigenous vegetables for their required usage. In addition, the survey is also in line with the transformation agenda of the Federal Government of Nigeria on food security, health and poverty alleviation, as indigenous vegetables play a highly significant role in food security of the underprivileged in both urban and rural settings (Schippers, 1997). They can serve as primary foods or secondary condiments to dishes prepared from domesticated varieties. They are also valuable sources of energy and micronutrients in the diets of the communities (Grivetti and Ogle, 2000). Further, they serve as income sources to the small farmers and may be marketed or traded locally, regionally, even internationally. In another form, the survey provides a general guide for collection and identification of underutilized vegetables in 6 (six) area councils of the FCT, Nigeria.

2. Study area

The Federal Capital Territory (FCT) lies between the latitude of 8025` and longitude 6045` and 7045`E. It is bounded by Kaduna State (to the North), by Kogi State (to the south) by Niger State (to the West) and Nasarawa State (to the East). The Area Councils in the Federal Capital Territory are six (6) in number. These include Gwagwalada, Kuje, Kwali, Bwari, Abaji and the Abuja municipal area council shown in Figure 1.

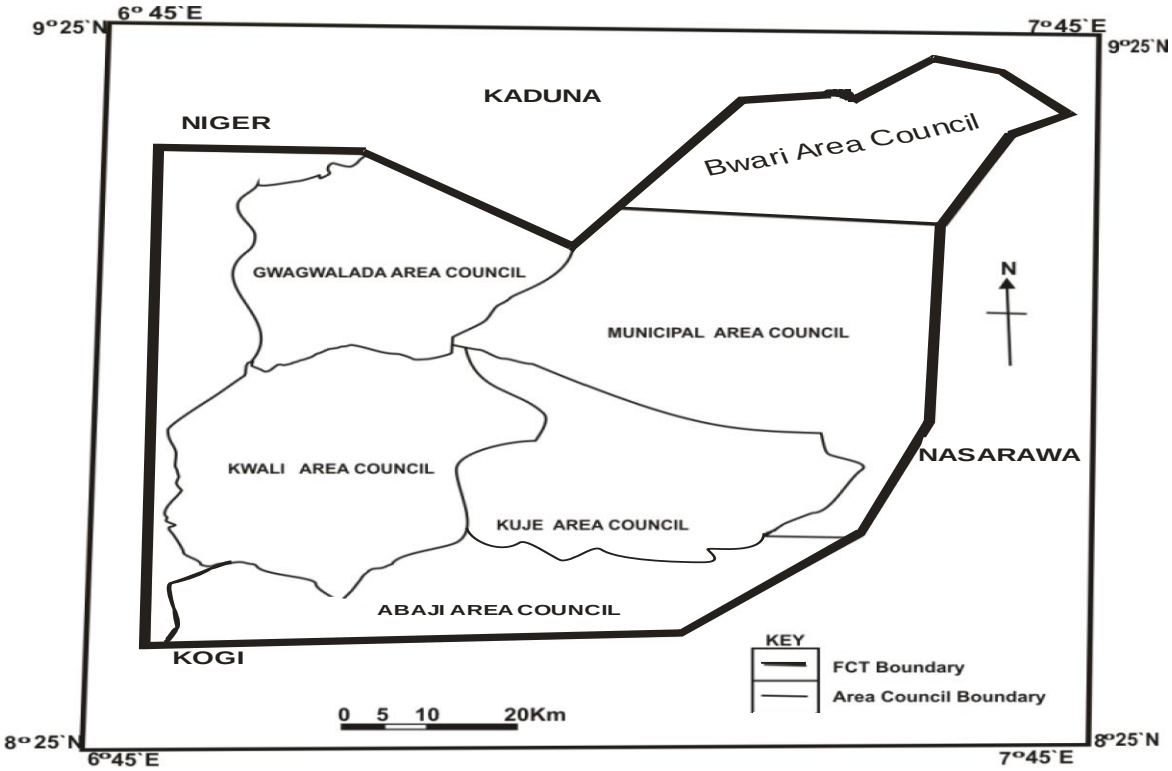

Figure 1. Map of federal capital territory showing the six area councils (AGIS., 2004)

3. Methodology

3.1. Field surveying and collection of plants

Literature review was done to provide baseline information on plants that are used as vegetables and other uses. The wild leafy vegetable plants are collected in a sample collection polyethene bag using sharp knife, after which a market survey was carried out to know the available leafy vegetables in the Federal Capital Territory markets (this cuts across the six area councils).

The various leafy vegetables that were displayed for sale in the markets were recorded. Issues such as local name of the plants, parts used and other uses were asked, the respondents were made up of farmers, hunters, traditional doctors and herbals sellers. The vegetable sellers were interviewed for the purpose of getting more information on the usage of various vegetables and their sources.

The identification of the vegetable plants was done by Mr.Segun O. and confirmed by Professor Omotoye Olorode (Botanist). Department of Biological Science University of Abuja. F.C.T, Abuja Nigeria, and by comparing collections with the University of Abuja Herbarium specimens.

Nevertheless, the other relevant informations for this ecological survey were compiled from books, journals, and magazines, (i.e., Ayodele, 2005; Adekunle, 1998; Bala, 2006; Burkill, 1997; Okojie and Okoli, 1993; Wikipedia; and www.worldagroforestrycentre.org) and the voucher specimens for this work have been deposited at the University of Abuja Herbarium.

4. Result and discussion

Subsequent to the collection of both wild and domestic leafy vegetables, the results are tabulated based on the plants scientific name, authorities, family name, part of the plants used as vegetables, mode of propagation, habit and husbandry. In addition, statistical bar and pie chart are illustrated for more clarification.

4.1. Discussion

A total of sixty (60) underutilized vegetables were collected from the Federal Capital Territory Abuja, Nigeria (the collection cut-across all the six Area Councils in F.C.T i.e. Abuja Municipal, Kuje, Bwari, Kwali, Gwagwalada and Abaji (Table 1). Being the Federal Capital of Nigeria, the national socio-ethnic diversity is well represented. The market and field survey showed the level of awareness as regard to the usefulness of the plants collected in different parts of the Area. Also some of them are used in other African countries but not in Nigeria. The study revealed that out of the sixty plants collected only 8% are sometimes brought to market for sale in FCT, Nigeria (Figure: 4).

The preponderance of the members of *Fabaceae* (Table 2) among the plants collected can be understood if the vegetation type of the Nigerian Federal Capital is taken into consideration (Guinea Savanna vegetation). There are mixtures of grasses and legumes to bring about a balance in the ecosystem.

The legumes fix nitrogen into the soil for the grasses to use. The percentages of the underutilized vegetables that are cultivated (though less cultivated) are lower than those whose germplasm existence is at the mercy of the various unfriendly environmental anthropogenic activities. Awareness of the importance of these less-known vegetable plants will save them from extinction. This can be made possible if people appreciate their usefulness in terms of food crops and medicinal importance. Realization and appreciation of an organisms` niche in an ecosystem saddles a co-conservative niches on the organization components of

such system. The fact that most of these plants can be propagated through seeds makes their germplasm to be conserved and cultivated easily.

In conclusion, indigenous vegetables have been proved to have diet enrichment values, apart from being source of vitamins. Therefore no effort is too much in bringing awareness to the usefulness and conservation of these useful for well-being but less known plants.

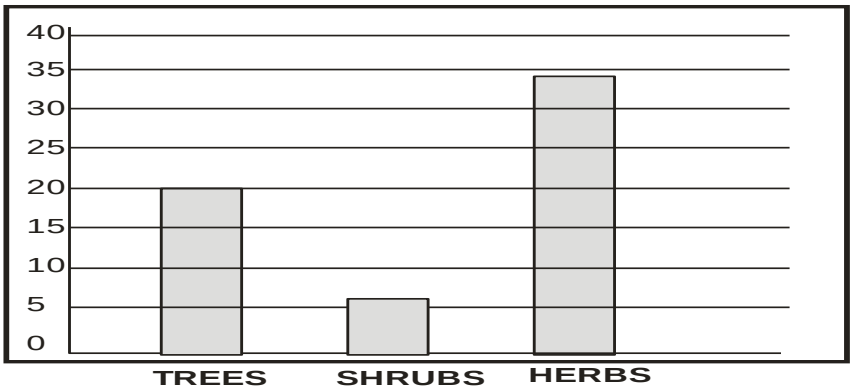

Figure 2. Vegetables distribution base on habit

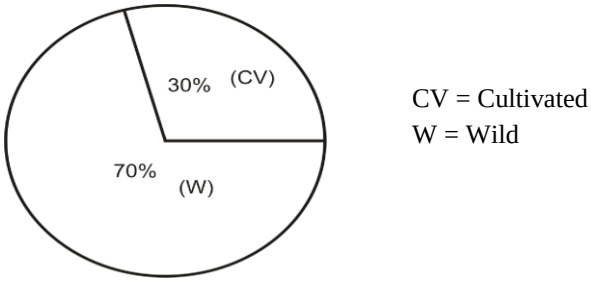

Figure 3. Percentage of the cultivated and wild vegetables species

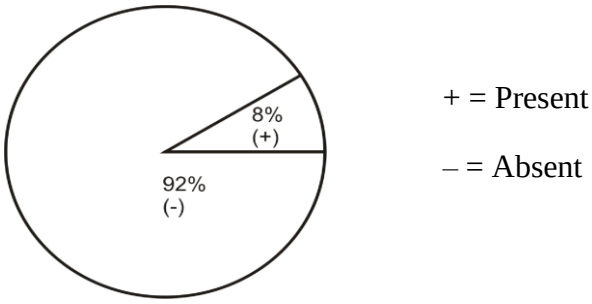

Figure 4. Percentage of the cultivated and wild vegetables species.

Table 1. The Underutilized Vegetable Plants Collected

S/N	Botanical Name	Authority	Family	Part Used	Mode of Propagation	Other Uses	Habit	Husbandry
1	Boerhavia diffusa	Linn	Nyctaginaceae	Leaves	Seed	medicinal	Herb	Wild
2	Ceiba pentandra	Linn., Gaertn	Bombacanceae	Leaves (Young)	Seed/Stem	Food	Tree	Wild
3	Cerathotheca sesamoides	Endl-	Pedaliaceae	Leaves	Seed	Food	Herb	Cultivated
4	Annona Senegalensis	Pers-	Annonaceae	Leaves (Young)	Seed	Medicinal	Shrub	Wild
5	Talinum triangulare	Jacq, Willd	Portulacaceae	Leaves	Seed/Stem	Medicinal	Herb	Cultivated
6	Vitex doniana	Sweet	Verbenaceae	Leaves (Young)	Seed	Medicinal	Tree	Wild
7	Lactuca Taraxacifolia	Willd, Amin-	Asteraceae	Leaves	Seed	Food	Herb	Wild
8	Argemone Mexicana	Linn-	Papaveraceae	Leaves	Seed	Medicinal	Herb	Cultivated
9	Cajanus Cajan	Linn, Mill-	Fabaceae	Leaves	Seed	food	Shrub	Cultivated
10	Phaseolus lunatus	Linn-	Fabaceae	Leaves	Seed	Food	Herb	Cultivated
11	Celosia Trigyna	Linn-	Amaranthaceae	Leaves	Seed	Fodder	Herb	Wild
12	Manihot esculentus	Linn-	Euphorbiaceae	Leaves (young)	Stem	Food	Tree	Cultivated
13	Crassocephalum crepidioides	(Benth)S Moore-	Astaraceae	Leaves	Seed	Medicinal	Herb	Wild
14	Corchorus aestuans	Linn-	Tiliaceae	Leaves	Seed	Fodder	Herb	Cultivated
15	Senna obtusfolia	Linn, Irwin & barneby	Fabaceae	Leaves	Seed	Medicinal	Herb	Wild
16	Cucurbita	Duch-	Curcubitaceae	Leaves/ fruit	Seed	Food	Herb	Cultivated
	Maxima							
17	Adansonia digitata	Linn-	Bombacaceae	Leaves	Seed	Fruit pulp edible food	Tree	Wild
18	Moringa oleifera	Lam-	Moringaceae	Leaves	Seed/Stem	Medicinal	Tree	Cultivated
19	Strychnos spinosa	Lam.	Loganiaceae	Leaves (young)	Seed	Food	Tree	Wild
20	Tamarindus indica	Linn.	Fabaceae	Leaves	Seed	Fodder	Tree	Cultivated
21	Combretum glutinosum	Perrot. ex DC	Combretaceae	Leaves	Seed	Medicinal	Tree	Wild
22	Lagenaria siceraria	Molina, Standl-	Curspitaceae		Seed	Medicinal	Herb	Cultivated
				Leaves				
23	Combretum micranthum	G.Don	Combretaceae	Leaves	Seed	Fodder	Tree	Wild
24	Corchorus tridens	Lam.	Tiliaceae	Leaves	Leaves	Food	Herb	Wild

S/N	Botanical Name	Authority	Family	Part Used	Mode of Propagation	Other Uses	Habit	Husbandry
25	Calotropis procera	Ait, Ait. F.	Asclepiadaceae	Leaves (Young)	Seed/Stem	cheese making	Tree	Wild
26	Acacia albida	Del.	Fabaceae	Leaves (Young)	Seed	fodder	Tree	Wild
27	Acacia seyal	DC-	Fabaceae	Leaves (Young)	Seed	fodder	Tree	Wild
28	Physalis angulata	Linn-	Solanaceae	Leaves	Seed	medicinal	Herb	Wild
29	Basella alba	Linn-	Basellaceae	Leaves	Seed/ Rhizomes	medicinal	Herb	Cultivated
30	Leptadenia hastata	(pers.) Decne	Asclepiadaceae	Leaves	Seed	Food	Shrub	Cultivated
31	Cleome gyanandra	Linn-	Cleomaceae	Leaves	Seed	Fodder	Herb	Wild
32	Bidens Pilosa	Linn-	Astaraceae	Leaves	Seed	Food	Herb	Wild
33	Portulaca oleracea	Linn-	Portulacaceae	Leaves	Seed/Stem	Medicine	Herb	Wild
34	Ipomoea Batatas	Linn, Lam	Convolvulaceae	Stem, Leaves	Stem	Fodder	Creeping herb	Cultivated
35	Pennisetum purpureum	Schumach.	Poaceae	Leaves	Seed/ Rhizome	Fodder	Herb	Wild
36	Stylochiton hypogeeus	Lepr.	Araceae	Leaves	Underground stem	Medicinal	Herb	Wild
37	Amaranthus spinosus	Linn.	Amaranthaceae	Leaves	Seed	Food	Herb	Wild
38	Acanthospermum hispidum	DC.	Astaraceae	Leaves	Seed	Medicinal	Herb	Wild
39	Zornia glochidiata	Rchb. ex Dc	Fabaceae	Leaves	Seed	Fodder	Herb	Wild
40	Maytenus senegalensis	Lam, Excel	Celastraceae	Leaves	Seed	Medicinal	Tree	Wild
41	Jatropha curcas	Linn-	Ephorbiaceae	Leaves	Seed/Stem	Medicinal	Shrub	Cultivated
42	Hibiscus asper	Hook, F.-	Malvaceae	Leaves	Seed	Medicinal	Herb	Wild
43	Arachis hypogea	Linn,	Fabaceae	Leaves	Seed	Food	Herb	Cultivated
44	Leucaena leucocephala	Lam, De wit	Fabaceae	Leaves	Seed/Stem	Medicinal	Tree	Cultivated
45	Spondias mombin	Linn-	Anacardiaceae	Leaves	Seed/Stem	Medicinal	Tree	Wild
46	Venonia colorata	Wild, Drake	Asteraceae	Leaves	Seed	Medicinal	Herb	Wild
47	Trianthema portulacastrum	Linn-	Aizoaceae	Leaves	Seed	Medicinal	Herb	Cultivated
48	Hisbiscus sabdariffa	Linn-	Malvaceae	Leaves	Seed	Medicinal	Herb	Wild
49	Aframomum melegueta	K. S. Chum	Zingiberaceae	Seed	Seed/ Rhizome	Medicinal	Herb	Wild
50	Vigna subterranea	Linn, Verdc	Fabaceae	Seed	Seed	Medicinal	Herb	Cultivated
51	Vernonia amygdalina	Delile	Astaraceae	Leaves	Seed/Stem	Medicinal	Shrub	Cultivated

S/N	Botanical Name	Authority	Family	Part Used	Mode of Propagation	Other Uses	Habit	Husbandry
52	Colocasia esculenta	Linn, Schott	Araceae	Leaves/ Stem	Stem	Food	Herb	Cultivated
53	Striga hermonthica	Del, Benth-	scrophulariaceae	Leaves	Seed	Fodder	Herb	Wild
54	Detarium microcarpum	Guill & Perr	Fabaceae	Leaves	Seed	Medicinal	Herb	Wild
55	Lippia multiflora	Moldenke et cith.	Verbenaceae	Leaves	Seed	Medicinal	Shrub	Wild
56	Newbouldia laevis	Seem	Bignoniaceae	Back	Seed	Medicinal	Tree	Cultivated
57	Daniella oliveri	Rolfe, Hutch	Fabaceae	Leaves	Seed	Medicinal	Tree	Wild
58	Afzelia africana	SM	Fabaceae	Leaves	Seed	Fodder	Tree	Wild
59	Ziziphus spina-christy	Linn, Desf	Rhamnaceae	Leaves	Seed	Fodder	Tree	Wild
60	Ziziphus mauritiana	Lam	Rhamnaceae	Leaves	Seed	Medicinal	Tree	Wild

Table 2. Distribution of the Species According to the families

S/No.	Family	Number of species
1	Amaranthaceae	2
2	Annacardiaceae	1
3	Annonaceae	1
4	Aizoaceae	1
5	Asclepiadaceae	1
6	Asteraceae	6
7	Apocynaceae	1
8	Araceae	2
9	Basellaceae	2
10	Bignoniceae	1
11	Bombacaceae	2
12	Caleomaceae	1
13	Celastraceae	1
14	Combretaceae	2
15	Convolulaceae	1
16	Cucumbitaceae	2
17	Euphorbiaceae	2
18	Fabaceae	13
19	Loganiaceae	1
20	Malvaceae	2

S/No.	Family	Number of species
21	Moringaceae	1
22	Nyctanginaceae	1
23	Paparveraceae	1
24	Pedaliaceae	1
25	Poaceae	1
26	Portulacaceae	2
27	Rhamnaceae	2
28	Scrophulariaceae	1
29	Solanaceae	1
30	Tiliaceae	2
31	Verbenaceae	1
32	Zingiberaceae	1

References

Abuja Geographical Information Services, AGIS (2004), "Map of Abuja and its environs", available at: http://fcda.gov.ng/index.php?option=com_content&view=article&id=32&Itemid=68.

Adekunle, M.F. (1998), Survey of Non-timber forest product (NTFPs) and their uses in Ogun State, Nigeria: A case study of Omo Forest Reserve, M.F.Thesis University of Agriculture, Abeokuta Nigeria (unpublished paper) p. 74.

Akinyemi J.O. (1998), The Uses of Forest Leaves in Omo Forest Reserve, Ogun State, Nigeria, Department of Environmental Management and Toxicology, University of Agriculture, Abeokuta. P.M.B. 2240, Ogun state, Nigeria.

Ayodele A.E. (2005), The medically important leafy vegetables of southwestern Nigeria Ethnological leaflet issue, article 6 the vekeley electronic press (beprese).

Bala S.A. (2006), Common ethnomedicinal plants of the semi-arid regions of West Africa, their description and phytochemicals, (Trium publishing company. Kano Nig.), Volume 1, ISDN: 9781881542.

Burkill H.T.U. (1997), The useful plant of the west tropical Africa, edited 2 Vol. 4.

Denton, L. and Ojeifo, I.M. (1993), Neglected vegetable crops in Nigeria. In: Lost crops of Nigeria: (unpublished paper).

Okojie, J.A. and Okali, D.U. (Ed.) (1993), Implication for food security. University of Agriculture, Abeokuta, Nigeria, pp. 5 - 107.

FAOSTAT (2007), Food and Agriculture Organization Corporate Statistical Database FAOSTAT On-line, United Nations Food and Agriculture Organization, Rome, http://faostat.fao.org/default.aspx.

Grivetti, L.E. and Ogle, B.M. (2000), "Value of Traditional Foods in Meeting Macro- and Micronutrient Needs: The Wild Plant Connection", *Nutrition Research Reviews,* Vol. 13 No. 1, pp. 31–46.

Grubben, J.H., Siemonsma, J.S. and Piluek, K. (Ed.) (1994), Introduction to Plant resources of South-East Asia. No. 8: Vegetables. Bogor, PROSEA Foundation, Indonesia, pp. 17-54.

Okali, D.U.U. and Ola Adams, B.A. (1987), "Tree population changes in treated rainforest at Omo Forest Reserve, South Western Nigeria", *Nigerian. Journal of Tropical Ecology*, Vol. 3, pp. 291-313.

Schippers, R. (1997), Domestication of Indigenous Vegetables for Sub-Saharan Africa: A Strategy Paper on African Indigenous Vegetables, Workshop Proceedings, January 13- 18, 1997, Limbe, Cameroon, pp. 125–135.

Steinmetz K.A. and Potter, J.D (1996), "Vegetables, fruit, and cancer prevention: a review", *Journal of American Diet Association,* Vol. 96 No.10, PMID 8841165.

Woodruff, S.L. (1995), *Secrets of Fat-Free Cooking: Over 150 Fat-Free and Low-Fat Recipes from Breakfast to Dinner-Appetizers to Desserts*, Avery Publishing Group, Garden City Park, NY.

Whitaker, J. M. (2001), *Reversing Diabetes*, Warner Books, New York.