Journal of Natural Sciences Research www.iiste.org
ISSN 2224-3186 (Paper) ISSN 2225-0921 (Online)
Vol.3, No.7, 2013

Ethnobotanical Survey of Edible Wild Plants in Tiv Communities of Benue State, Nigeria

Shomkegh, Simon Alyegba[1]*, Mbakwe Roy[2], Dagba, Benjamin Ioryem[1]
1.Department of Social & Environmental Forestry, University of Agriculture,
P.M.B 2373 Makurdi, Benue State, Nigeria
2.Department of Forestry and Environmental Management, Michael Okpara University of Agriculture
P.M.B 7267 Umudike, Abia State, Nigeria
*E-mail of corresponding author: sshomkegh@gmail.com

Abstract
Many people in rural communities of developing countries rely on wild edible plants for food especially during crop failures, famine or periods just before new harvests when many families run out of foodstuff. Documenting wild edible plants of indigenous groups can provide information for planning, conservation and further research especially in propagation, domestication and evaluation of nutritional profiles to obtain nutrient composition. In Tiv communities of Benue State, there is no documented quantitative or qualitative information on available wild edible plants. The aim of the research was to identify wild edible plants consumed in Tiv communities of Benue State and also obtain their uses/use categories. Ethnobotanical data was obtained through field walks and semi-structured interviews with active users made up of adults and young people. Through the free listing method, each community provided information on wild edible plants utilized and collections were made and preserved for future study. A total of 42 wild plants species in 27 families were identified as edible plants utilized by the local people and ruminants. The plants were eaten as vegetables/soup, fruits and animal food while others had multiple edible uses. The development of these plant species through determination of nutritional profiles will enhance nutrition and food security. Conservation practices and domestication programmes are also required for sustained availability and increase in dietary diversity.
Keywords: Ethnobotanical survey, Edible wild plants, Use categories, Browse plants, Tiv communities

Background

Millions of people in many developing countries do not have enough food to meet their daily requirements and a further more people are deficient in one or more micronutrients (FAO, 2004). According to Balemie and Kebebew (2006), rural communities in most cases depend on wild resources including wild edible plants to meet their food needs in periods of food crisis. Utilization of wild edible plants as a food source is an integral part of the culture of indigenous people that dwell in the rain forests of Africa and South America (Friedman *et al* 1993, Bussmann *et al* 2006, Grivetti and Ogle, 2000, Medley and Kalibo, 2007). A study conducted in Zimbabwe revealed that some poor households relied on wild fruits as an alternative to cultivated food for a quarter of all dry season's meals (Wilson, 1990). Similarly, in Northern Nigeria, leafy vegetables and other bush foods were collected as daily supplements to relishes and soups (Loghurst, 1986). Many wild edible plants are nutritionally rich (Ogle *et al,* 1985) and can supplement nutritional requirements, especially vitamins and micronutrients (Mohammed *et al,* 2008). Kabuye (1997) states that nutritional analysis of some wild food plants demonstrates that in many cases the nutritional quality of wild plants is comparable and in some cases even superior to domesticated varieties. Information on wild edible plants according to Tilahun and Mirutse (2010) may be useful in identifying wild edible plants that can improve nutrition, increase dietary diversity and may also have the potential to be valuable food sources if cultivated, becoming an important strategy in tackling food insecurity.

Methodology

Study area

Benue state is located in the derived/guinea savannah region of Nigeria. It lies between latitudes $6^0$25'N and $8^0$8'S and longitudes $6^0$25'N and 10^0E. The climate is characterized by wet and dry seasons. The rainy season is brought about by moisture laden south westerly monsoon winds from the Atlantic Ocean, while the dry dust laden harmattan prevailing North- Easterly winds heralds the dry season. The vegetation in the State decreases in thickness from the derived savannah in the south to the guinea savannah in the north (Verinumbe *et al*. 2002) and comprises of forests (mostly riparian forests along rivers, streams and relics of the rain forest in the south) and scattered trees in grasslands. The State is made up of 23 local Government Areas (LGAs), out of which 14 LGAs (comprising Tarka, Ukum, Gboko, Guma, Logo, Buruku, Katsina-Ala, Kwande, Vandeikya, Gwer, Gwer-West, Makurdi, Ushongo and Konshisha LGAs) are within the ethnic territory of the Tiv people while 9 are for the Idoma and Igede ethnic groups.

Field study

Ethno-botanical data was obtained through the collection of plant specimens and semi- structured interviews with elders and other local users (Tesfaye *et al,* 2009, Perez- Negron and Casas, 2007) using group discussions (Tilahun and Mirutse, 2010). Three Local Government Areas (LGAs) in Benue State namely; Guma (Benue-North), Gboko (Benue -central) and Kwande (Benue-South) within the Tiv territory were purposely selected to reflect the vegetation stratification in Benue State, North Central Nigeria. Three sub-tribes were randomly selected in each of the selected LGAs within the Tiv territory to identify wild edible plants and their uses/use categories. Men, women and young people involved in the use of wild edible plants in each of the sub-tribes selected were engaged in group discussions to elicit community-level information on plants species eaten in each community.

In each community group discussion, the purpose of the study was clearly explained and a verbal Prior Informed Consent (PIC) was obtained before the commencement of interviews in each of the sub-tribes (Jain *et al*, 2011, Alessandro *et al*, 2012). The free listing method (Reyes-Gracia *et al*, 2006, Agbogidi, 2010) which required participants to list the names of all wild edible plants collected in their communities was adopted. Once they stopped naming, they were prompted to list more by asking if they could remember any other wild plant eaten in the community. Volunteers among the users in the community were requested for a walk into the field (forestlands, farmlands and fallow lands) for the collection of the plants listed and any other edible plant found that was not listed. Whole plants/ plant parts such as small branches with leaves, flowers, fruits and bark (where necessary) were collected. During the interviews, each plant was picked and the people gave information on which part was eaten. The sessions were tape recorded and notes taken were read out to the community people at the end of each session for local validation. Plant species collected were identified by their local names (Agishi, 2010), standard texts (Arbonnier, 2004, Keay, 1989) and with the aid of virtual herbaria. Herbarium specimen for each of the plants collected were prepared and kept in the herbarium, Department of Forest Production and Products, University of Agriculture Makurdi, Nigeria for future reference and study.

Results and Discussion

A total of 42 plants species in 27 families were identified and documented as wild edible plants utilized by the local people and ruminants in Tiv communities of Benue State. The plants were eaten as vegetables/soup and fruits. Some plants served as animal food for ruminants while others had multiple edible uses. In Guma LGA, 32 edible plant species in 21 families were identified; 17 eaten as vegetables/soup, Eighteen (18) plant species were consumed as fruits and 4 species browsed by domestic and wild ruminants while six (6) plants were found to have multiple edible uses (Table 1).

Table 1: list of wild plants eaten in Guma Local Government Area of Benue State, Nigeria

S/no	Botanical name	Family name	Local name(Tiv)	Use(s)
1	*Vitex doniana*	Verbaenaceae	Hulugh	Tender leaves as vegetable, ripe fruits eaten.
2	*Piliostigma thornningii*	Caesalpinioideae	Nyihar	A solution of boiled leaves used in fermenting palp.
3	*Parinari curatellifolia*	Chrysobalanaceae	Bua-ikuna	Ripe fruits eaten, slender branches as chewing stick
4	*Cissus pulponea*	Vitaceae	Ager	Stem, tender leaves and flowers for soup, ripe fruits pounded and prepared as draw soup, cut stems of living plants provide water for the thirsty.
5	*Ficus sur*	Moraceae	Tur	Ripe fruits eaten, tender leaves as vegetable.
6	*Stereospermum kunthianum*	Bignoniaceae	Umanatumba	Slender branches as chewing stick
7	*Kigelia africana*	Bignoniaceae	Tiembegh	Flowers eaten as vegetable.
8	*Borassus aethiopum*	Arecaceae	Akuugh	Ripe fruits can be planted and resulting rhizome boiled and eaten, stem apex tapped as palm wine.
9	*Pterocarpus santalinoides*	Fabaceae	Sughun	Tender leaves as vegetable.
10	*Bombax costatum*	Bombacaceae	Genger	Flowers dried and cooked as

				soup
11	*Acacia nilotica*	Mimosoideae	Saa anula	Seeds locally processed and eaten as condiment, Young leaves eaten by cattle, goats and sheep.
12	*Prosopis africana*	Mimosoideae	Gbaaye	Seeds locally processed as a condiment for soup. The caterpillar which feed on the leaves is fried and eaten
13	*Fluggea virosa*	Euphorbiaceae	Yareghagum	Tender leaves and fruits eaten by goats, sheep and cattle.
14	*Saba comorensis*	Apocynaceae	Ipungwa, Apungwa	Ripe fruits eaten
15	*Afzelia africana*	Caesalpinioidae	Yiase	Fruits processed as condiment. Tender leaves as vegetable. Leaves as food for ruminants
16	*Pachystela pobeguiniana*	Sapotaceae	Akoondu, koondo	Ripe fruits eaten
17	*Elaeis guineensis*	Arecaceae	Ikye, Ivile	Tapped as palm wine, fruit pulp eaten raw and processed as cooking oil.
18	*Sarcocephalus latifolius*	Rubiaceae	Ikyura-ukase	Ripe fruits eaten
19	*Detarium microcarpum*	Caesalpinioideae	Lienegh	Ripe fruits eaten, seeds grinded for soup.
20	*Gardenia erubescens*	Rubiaceae	Shoondugh, Ishondou	Ripe fruits eaten
21	*Irvingia gabonensis*	Irvingiaceae	Iveh	Seeds pounded for soup, fruit mesocarp eaten
22	*Strychnos spinosa*	Loganiaceae	Maku	Ripe fruits eaten
23	*Grewia venusta*	Tiliaceae	Hwerza, Hueza	Peeled bark prepared as draw soup.
24	*Celosia argentea*	Amaranthaceae	Igyar	Whole plant eaten as vegetable
25	*Parkia biglobosa*	Mimosoideae	Nune	Seeds processed as condiment. Pod pulp eaten by licking,
26	*Vitellaria paradoxa*	Sapotaceae	Chamegh, Ichamegh	Ripe fruit pulp eaten, seeds processed as edible oil. The caterpillar which feeds on the leaves is edible.
27	*Daniella oliveri*	Caesalpinioideae	Chiha	Tender leaves eaten as vegetable.
28	*Emilia coccinea*	Asteraceae	Aninge	Whole shoot eaten as vegetable
29	*Corchorus tridens*	Tiliaceae	Ityever	Leaves eaten as vegetable
30	*Annona senegalensis*	Annonaceae	Ahur, Hur	Ripe fruits eaten
31	*Imperata cylindrical*	Poaceae	Ihila, Hila	Matured roots eaten
32	*Syzygium guineense*	Myrtaceae	Mho	Ripe fruits eaten

In Gboko LGA, 26 wild edible species in 19 families were noted; 17 eaten as vegetables/soup, 16 as fruits and 4 browsed by ruminants while 8 had multiple edible uses (Table 2).

Table 2: list of wild plants eaten in Gboko Local Government Area of Benue State, Nigeria

S/No	Botanical name	Family name	Local name (Tiv)	Use(s)
1	*Milicia excels*	Moraceae	Leke	Tender leaves for vegetable soup
2	*Bridelia ferruginea*	Euphorbiaceae	Kpine	Ripe fruits eaten
3	*Vitex doniana*	Verbenaceae	Hulugh	Ripe fruits eaten, tender leaves as fresh/dried leafy vegetable
4	*Cissus pulponea*	Vitaceae	Ager	Tender leaves as vegetable, pounded fruits as soup thickener, pounded stem and roots as draw soup
5	*Gardenia erubescens*	Rubiaceae	Ibohough, shondugh	Ripe fruits eaten
6	*Strychnos spinosa*	Loganiaceae	Maku	Ripe fruits eaten
7	*Annona senegalensis*	Annonaceae	Ahur	Ripe fruits eaten
8	*Afzelia africana*	Caesalpinioideae	Yiase	Tender leaves as vegetable, grinded seeds used in soups. leaves eaten by ruminants
9	*Acacia nilotica*	Mimosoideae	Saa anula	Seeds processed as condiment in soups.
10	*Grewia venusta*	Tiliaceae	Hwer-za	Mature stems processed as draw soup, processed bark mixed with ground beans to fry akara (beans cake) as it reduces drying of frying oil. Ripe fruits eaten.
11	*Elaeis guineensis*	Arecaceae	Ivile/Ikye	Fruit mesocarp eaten raw and processed into edible oil.
12	*Parkia biglobosa*	Mimosoideae	Nune	Seeds locally processed as condiment. Pod mesocarp eaten raw (by licking the yellowish mesocarp). Pods eaten by cattle.
13	*Pterocarpus sanlinoides*	Fabaceae	Kilaka, Sughun, Kereke	Tender leaves as vegetable. Roasted ripe fruits eaten as like groundnuts.
14	*Syzygium guineense*	Myrtaceae	Mho	Ripe fruits eaten
15	*Saba comorensis*	Apocynaceae	Ipungwa, Apungwa	Ripe fruits eaten
16	*Daniellia oliveri*	Caesalpinioideae	Chiha	Tender leaves as vegetable.
17	*Piliostigma thornningii*	Caesalpinioideae	Nyihar	Tender leaves as vegetable.
18	*Maranthes polyandra*	Chrysobalanaceae	Bua	Fruits eaten, seeds cracked and eaten.
19	*Kigelia africana*	Bignoniaceae	Tyembegh	flowers eaten as vegetable
20	*Emilia coccinea*	Asteraceae	Aninge	whole plant eaten as vegetable
21	*Prosopis africana*	Mimosoideae	Gbaaye	Seeds prepared as condiment, fruit pulp licked, leaves as feed for cattle, sheep and goats
22	*Sterculia setigera*	Sterculiaceae	Kumendur	Leaves eaten by cattle.
23	*Bombax costatum*	Bombacaeae	Genger	Flowers prepared as soup.
24	*Fluggea virosa*	Euphorbiaceae	Azizo/ Yareghagum	leaves eaten by ruminants
25	*Ficus sur*	Moraceae	Tur	Ripe fruits eaten, Tender leaves mashed and eaten as a vegetable.
26	*Corchorus tridens*	Tiliaceae	Atyever	Leaves eaten as vegetable

Thirty edible plant species in 19 families were documented in Kwande LGA with 12 species eaten as

vegetables/soup, 19 as fruits, 4 as browse plants while 7 had multiple edible uses (Table 3).

Table 3: List of wild plants eaten in Kwande Local Government Area of Benue State, Nigeria

S/No	Botanical name	Family name	Local name(Tiv)	Use(s)
1				
2	*Vitellaria paradoxa*	Sapotaceae	Chamegh	Ripe fruit pulp eaten
3	*Afzelia africana*	Caesalpinioideae	Yiase	Ripe fruits eaten, tender leaves as vegetable fried seeds as soup thickener. Leaves browsed by ruminants.
4	*Parkia biglobosa*	Mimosoideae	Nune	Seeds processed as a condiment, fruit pulp eaten.
5	*Daniellia oliveri*	Caesalpinioideae	Chiha	Tender leaves eaten by ruminants
6	*Isoberlinia doka*	Caesalpinioideae	Akovor	Tender leaves as vegetable
7	*Cissus pulponea*	Vitaceae	Ager	Tender leaves, fruits and stems prepared as soup
8	*Prosopis africana*	Mimosoideae	Gbaaye	Seeds locally processed as condiment, boiled seed epicarp dried and cooked as soup.
9	*Sarcocephalus latifolius*	Rubiaceae	Ikura-ukase	Ripe fruits eaten
10	*Vitellaria paradoxa*	Sapotaceae	Hulugh	Tender leaves as vegetable, fruit pulp eaten.
11	*Saba comorensis*	Apocynaceae	Ipungwa,	Ripe fruits eaten
12	*Uvaria chamae*	Annonaceae	Ikyo, Ikyoh	Ripe fruit pulp edible.
13	*Kigelia africana*	Bignoniaceae	Tiembegh	Flowers prepared as vegetable soup
14	*Raphia sudanica*	Arecaceae	Ichoor, choo	Ripe fruits eaten, stem tapped as wine.
15	*Maytenus senegalensis*	Celastraceae	Alomade	Ripe fruits edible.
16	*Annona senegalensis*	Annonaceae	Ahur	Ripe fruits edible.
17	*Detarium microcarpum*	Caesalpinioideae	Agalien, Agashidam, Akomboadam Lienegh	Ripe fruits eaten, tender leaves eaten as vegetable, Leaves and fruits browsed by ruminants.
18	*Strychnos spinosa*	Loganiaceae	Amaku, Maku	Ripe fruits eaten, tender leaves eaten as vegetable.
19	*Berlinia grandiflora*	Caesalpinioideae	Ten	Processed seeds eaten as condiment.
20	*Syzygium guineense*	Myrtaceae	Mho	Fruit pulp eaten raw
21	*Piper guineense*	Piperaceae	Yiye	Fried fruits as an aromatic spice in soups, leaves very sweet.
22	*Khaya senegalensis*	Meliaceae	Haa	Leaves eaten by ruminants.
23	*Ficus sur*	Moraceae	Tur	Ripe fruits eaten, tender leaves eaten as vegetable
24	*Pachystela pobeguiniana*	Sapotaceae	Akoondu, koondo	Ripe fruits eaten
25	*Emilia coccinea*	Asteraceae	Aninge	whole plant eaten as vegetable
26	*Strychnos spinosa*	Loganiaceae	Maku	Ripe fruits eaten
27	*Borassus aethiopum*	Arecaceae	Akuugh, kuugh	Ripe fruits planted and resulting rhizome boiled and eaten
28	*Zanthoxylum zanthoxyloides*	Rutaceae	Ayegh	dried bark(grinded) used as a flavour in soup
29	*Corchorus tridens*	Tiliaceae	Atyever	Leaves eaten as vegetable
30	*Fluggea virosa*	Euphorbiaceae	Azizo/ Yareghagum	leaves eaten by ruminants

Seventeen (17) species were common in the 3 LGAs while few such as *Zanthoxylum zanthoxyloides, Piper guineense and Berlinia grandiflolia* were noted only in Kwande LGA due to nearness to the rainforest ecosystem. Different categories of wild edible plants were noted in Tiv communities of Benue State (Table 4). In all the LGAs, plants were mostly utilized as fruits (39.39%) and vegetables/soup (35.6%) while the least use category

was plants eaten by domestic and wild ruminants (8.33%). The women agreed they utilized the edible plants/plant parts in their meals almost on a daily basis especially during the rainy season when many of the plants especially vegetables were available, in agreement with Loghurst (1986). The vegetables were collected and prepared by women but eaten by every member of the household, as done in Ethiopia (Tilahun and Mirutse, 2010). The fruits were eaten raw and hunters acknowledged that they were quite helpful during hunting as they could pick and eat without processing. None of the plants in the various use categories was domesticated or cultivated by the community people but were noted to be utilized as substitutes to cultivated species during the rainy season/time of abundance.

Table 4: Number of edible plant species in different use categories in the study area

Use category /LGA	Vegetable/soup	Fruits	Animal food	Plants with multiple uses
Guma	18	18	4	7
Gboko	17	15	3	8
Kwande	12	19	4	7
Total	47	52	11	22
%	35.6	39.39	8.33	16.66

Plants browsed by domestic and wild ruminants

Some plant species were noted as browse plants especially by wild and domestic ruminants. In Guma LGA, *Afzelia africana, Prosopis africana, Acacia nilotica* and *Fluggea virosa* were utilized as feed for ruminants. *Sterculia setigera, Afzelia africana, Parkia biglobosa, Fluggea virosa* and *Prosopis africana* were eaten by ruminants in Gboko LGA while in Kwande LGA, *Khaya senegalensis, Afzelia africana, Fluggea virosa, Detarium microcarpum* and *Daniellia oliveri* were eaten by ruminants. The plant parts eaten were tender leaves, bark and pods/fruits and it was reported that nomads and other animal rearers often cut branches of *Afzelia africana* and *Fluggea virosa* to feed their animals, especially during the dry season when pasture was scarce.

Conclusion

Edible wild plant categories in Tiv communities of Benue State were identified and documented as vegetables/soups, fruits and browse plants while some plants had multiple uses. These plant species as utilized by all ages can contribute to the nutrition of the rural communities especially during famine, crop failures and food shortages. The plants can also contribute to food security if harnessed through effective conservation, awareness and development. Development of these wild plants by investigating suitable propagation options, determination of their nutritional profiles to obtain the nutritional values and wide dissemination of such information can enhance their value and conservation in Tiv communities of the state and beyond. The enactment and enforcement of appropriate laws and policies can be useful in forestalling the current unsustainable exploitation of some of the plant species in the State.

Acknowledgements

This work would not have been possible without the permission and support of community heads, leaders of user groups, field volunteers and other local participants, and their assistance is hereby highly acknowledged. The technical staff of Department of Forest Production and Products of the University of Agriculture Makurdi, Nigeria are also commended for their support in preparing herbarium specimen of wild edible plants/plant parts collected.

References

Agbogidi, O.M (2010). Ethnobotanical survey of Non-Timber Forest Products in Sapele Local Government Area of Delta State. African journal of plant science Vol. 4 (3), Pp 183-189.

Agishi, E.C. (2010). Tiv, Idoma, Etulo, Igede,Akwaya,Hausa, English and Scientific names of plants, 2nd Edition, Agitab publishers Ltd Makurdi, 394 pp

Alessandra di T, Lukasz,J.L, Cassandra, L.Q and Sulejman,R (2012).Traditional and herbal uses of wild plants in the ancient South-Slavic diaspora of Mundimitar/Montemitro (Southern Italy). *Journal of Ethnobiology and Ethnomedicine* 8: 21

Arbonnier, M. (2004). Trees, shrubs and lianas of West African dry zones, 2nd Edition.CIRAD,MARGRAF PUBLISHERS GMBH MNHN, Germany. 575Pp

Jain, A., M. Sundriyal, S.Roshnibala, R Kotoky, P.B. Kanjilal, H.B. Singh and R.C. Sundriyal (2011). Dietary use and conservation concern of edible wetland plants at indo-burma hotspot: a case study from northeast India. *Journal of Ethnobiology and Ethnomedicine* 7:29

Keay, R. W. J. (*1989)*. Trees of Nigeria. Oxford University Press, Walnut street, Oxford OX2 476Pp.

Perez-Negron and Casas,A. (2007). Use,extraction rates and spatial availability of plant resources in the Tehuacan-Cuicatlan valley,Mexico. The case of Santiago Quiotepec, Oaxaca. *Jounal of Arid Environments* 70,356.

Reyes-García, V., V. Vadez, S. Tanner, T. McDade, T. Huanca, & W. R. Leonard (2006). Evaluating indices of traditional ecological knowledge: A methodological contribution. *Journal of Ethnobiology and Ethnomedicine* 2: 16

Tesfaye, H.B., Sebsebe D. W and Zemede, W.(2009). An ethnobotanical study of medicinal plants used by local people in the lowlands of Konta Special Woreda, southern nations, nationalities and peoples regional state, Ethiopia. *Journal of Ethnobiology and Ethnomedicine*, 5:26.

Tilahun, T. and Mirutse, G (2010). Ethnobotanical study of wild edible plants of Kara and Kwego semi-pastoralist people in Lower Omo River Valley, Debub Omo Zone, SNNPR, Ethiopia. *Journal of Ethnobiology and Ethnomedicine* 2010, 6:23

This academic article was published by The International Institute for Science, Technology and Education (IISTE). The IISTE is a pioneer in the Open Access Publishing service based in the U.S. and Europe. The aim of the institute is Accelerating Global Knowledge Sharing.

More information about the publisher can be found in the IISTE's homepage: http://www.iiste.org

CALL FOR PAPERS

The IISTE is currently hosting more than 30 peer-reviewed academic journals and collaborating with academic institutions around the world. There's no deadline for submission. **Prospective authors of IISTE journals can find the submission instruction on the following page:** http://www.iiste.org/Journals/

The IISTE editorial team promises to the review and publish all the qualified submissions in a **fast** manner. All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Printed version of the journals is also available upon request of readers and authors.

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar