

STUDIES OF THE INDIGENOUS EDIBLE WILD FRUITS OF ETCHE LOCAL GOVERNMENT AREA, RIVERS STATE, NIGERIA

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Received: 31-05-2023

Accepted: 05-09-2023

<https://dx.doi.org/10.4314/sa.v22i3.6>

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Journal Homepage: <http://www.scientia-african.uniportjournal.info>

Publisher: *Faculty of Science, University of Port Harcourt.*

ABSTRACT

In the past, Indigenous Edible Wild Fruits (IEWFs) were vital source of food and nutrition in Etche Local Government Area. These plant species were highly nutritious and assisted in poverty alleviation and enhanced food security in Etche. Presently, due to the teeming population and the anthropogenic activities in the area especially the farming practice of the local people, the availability and rate of consumption of the IEWFs have been negatively impacted. Information about these economic plant species that are domiciled in Etche has not been properly documented. This investigation seeks to fill the gap. IEWFs were identified in ten (10) study area communities. Scientific names, common names, local names, families, habits, habitat and locality of the plants were documented. It was observed that 36 plant species drawn from 29 genera, representing 23 families were Indigenous Edible Wild Fruits consumed regularly by Etche people. The study revealed that the fruit plants were 39% trees, 42% shrubs, 8% herbs and 11% climbers. In addition, most of the edible plant species in the area were exclusively found in the wild while a few were domesticated and some of them served as a source of income for some households. The study observed a decline in the diversity of species due to depletion of forest resources through bush burning, deforestation and exploitation of flora by the rural dwellers for other purposes.

Keywords: Etche, domestication, Indigenous Edible Wild Fruits (IEWFs) and species

INTRODUCTION

Indigenous Edible Wild Fruits (IEWFs) are invaluable plant resources for improving the food and nutritional security of households. They play a great role in supplementary food provision, closing food gaps during period of famine and droughts (Alebel and Mohammed, 2021). Edible Wild Fruits (EWFs) are edible fruit species which are not domesticated or cultivated by the people of a particular region but obtained from their natural habitat (Beluhan and Ranogajec, 2011). They are mainly consumed at specific seasons of the

year (Deshmukh and Waghmode, 2011). Though presently, agricultural communities depend mostly on improved cultivated varieties because of their health benefits, nutritional value, and higher productivity, however, the habit of consuming wild fruits has not been entirely abandoned (Locket *et al.*, 2000).

To meet global demand for food, considering the teeming population of the world, cultivation or domestication of other food producing plant species and intensifying the use of under-utilized and neglected species

including wild food resources which constitute a variety of edible fruits including wild edible fruits. Edible Wild Fruits constitute the most of the total number of wild edible resources (FAO, 2019). They have been discovered to be good sources of antioxidants, minerals and vitamins (Maroyi, 2011). Consequently, in most regions of the world, Edible Wild Fruits constitute a vital source of food, healthcare and material sustenance which aid survival of man (Sundriyal and Sundriyal, 2001). Cultivation and utilization of wild plants is an unexploited opportunity to alleviate malnutrition and ameliorate food insecurity in the country if properly managed. Most regions of the world traditionally use edible wild plant species for food, oil, or medicine but their potential uses are yet to be more developed (Alebel and Mohammed, 2021). Globally, it estimated that 80% of the population of developing countries use non-timber forest products to meet their needs in nutrition and health (FAO, 2019).

Edible Wild Fruits (IEWFs) constitute a vital component of the subsistent farming systems of the lowland rainforest of the Niger Delta areas. They are part of the rich biodiversity of the Niger Delta. A few of these plants have been domesticated, while a good number of others are obtained from the wild as part of the broad spectrum of non-timber forest products. The importance of the IEWFs in the nutrition and income of rural household in the lowland rainforest of the Niger Delta has been variously documented (NDES, 1996; NDWC, 1996; Idu *et al.*, 2007; Okafor, 1991; Obute and Ekiye, 2008 and Ubom, 2010).

Despite the availability and consumption of Edible Wild Fruits in Sokoto State, Nigeria, ethnobotanical documentation, nutritional analysis, domestication and conservation interventions are limited (Gada and Ismaila, 2021). They are neglected by agricultural researches, plant breeders and policy makers due to paucity of information on the economic contribution of the IEWFs to rural communities and lack of incentive-based fruit

production (Alebel and Mohammed, 2021). The dependence on Edible Wild Fruits is likely to dwindle over time following the accessibility of improved varieties and the cultivated flora. The decline in the diversity of species is due to depletion of forest resources through bush burning, deforestation and exploitation of flora by the rural dwellers (Yangchen and Chhoeda, 2017). Consequently, indigenous knowledge of plant species and the consumption of Wild Edible Fruits (WEFs) are dwindling rapidly among the younger generation. The extinction of indigenous taxonomic knowledge is linked to the reduction in plant diversity. With the increasing dwindling of indigenous knowledge on Wild Edible Fruits and increasing dependence on improved fruit varieties, there is a risk of complete displacement of wild fruits with imported fruit types, resulting in the disruption of the coexistence of people and the forest as well as loss of traditional knowledge of fruit plants (Alebel and Mohammed, 2021).

Domestication (the naturalization of species in human-induced ecosystems) and improving the productivity of wild edible plants and under-utilized species is a vital way and a basic requirement for increased and sustainable production and conservation. Domestication and cultivation of species is a vital convenient strategy to ameliorate the pressure on valuable and threatened wild flora and fauna. This option contributes immensely to conservation and wholistic economic developmental objectives. The domestication of locally marketed indigenous fruit trees also helps to restore depleted ecosystems and conserve their dwindling diversity (Alebel and Mohammed, 2021).

Etche is one of the major ethnic groups and also one of the Local Government Areas of Rivers State, Nigeria. It is largely situated on a plain land and occupies a geographical area of about 3,600 square kilometers mainly used for farming and hunting. Etche is situated in the North Eastern part of Rivers State (Nwogu *et al.*, 2003). It is relevant at this time

to document the indigenous Edible Wild Fruits in Etche and their indigenous potential for sustainable management of wild resources before the extinction of indigenous species and their traditional knowledge.

MATERIALS AND METHODS

The study was carried out in ten (10) communities in Etche Local Government Area of Rivers State, Nigeria. The communities include: Akwuobuo, Okehi, Chokocho, Umuoye, Ndashi, Ozuzu, Isu, Odufor, Obite and Obibi (Fig. 1). The communities under study were chosen by random sampling to avoid bias. The study

also involved detailed literature search, field visits and the use of structured questionnaire to obtain vital information such as scientific names of the IEFWs, local name, common name, family, habit, habitat and locality of the plants were documented. Similarly, domesticated IEFWs and the species that are sold in the market were also considered. Some of the common IEFWs were identified in the field while those species that could not be easily identified were taken to the University of Port Harcourt Herbarium for proper identifications and confirmation with the assistance of the Curator.

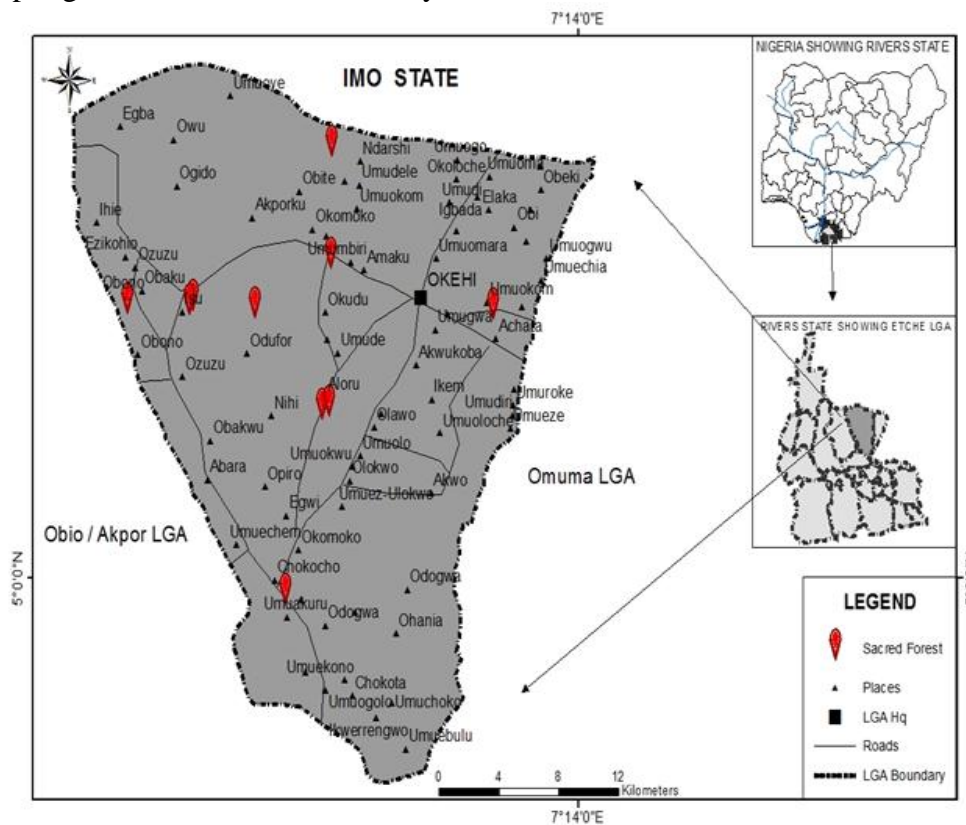


Fig. 1: Map of Etche LGA

RESULTS

The present study showed a large taxonomic diversity for IEFWs from Etche Local Government Area and it revealed that 36 plant species drawn from 29 genera, representing 23 families were Indigenous Edible Wild Fruits consumed regularly by

Etche people. The Summary of the Indigenous Edible Wild Fruits (IEFWs) in Etche was recorded in Table 1. It was observed that 39% of the fruit plants were trees, 42% were shrubs, 8% were herbs while 11% were climbers which are mostly used as fleshy fruit/dessert (Fig. 2). As at the time of this investigation, it was also observed that

the recorded IEWFs play various roles in the nutrition and household economy of Etche people as 56% of the IEWFs are sold in the

local market for household income while 44% are domesticated or cultivated (Table 2).

Table 1: Summary of Indigenous Edible Wild Fruits (IEWFs) of Etche

S/N	Species Name	Common Name	Local Name	Family	Habit	Habitat
1	<i>Aframomum melegueta</i> K. Schum	Melegueta pepper	Ose oji	Zingiberaceae	Herb	Swamp
2	<i>Alibertia patinoides</i> A.Rich. ex DC.	-	Araraa	Rubiaceae	Tree	Forest
3	<i>Artocarpus altilis</i> (Parkinson) Fosberg	Breadfruit	Jibekee	Moraceae	Tree	Forest
4	<i>Chrysophyllum albidum</i> Linn.	African star apple	Udara	Sapotaceae	Tree	Forest
5	<i>Cola hetrophylla</i> (P. Beauv.) Scott Endl.	-	Nkpishira ka umushii	Sterculiaceae	Shrub	Forest
6	<i>Cola millenii</i> K. Schum	Monkey kola	Ukukuru	Sterculiaceae	Shrub	Forest
7	<i>Cola nitida</i> (Vent.) Scott & Endl.	Kola nut	Oji	Sterculiaceae	Tree	Forest edges
8	<i>Cola pachycarpa</i> K. Schum	Monkey kola	Ayaaya	Sterculiaceae	Shrub	Forest edges
9	<i>Coula edulis</i> Baill.	African walnut	Ukpa	Olacaceae	Tree	Forest
10	<i>Dennettia tripetala</i> Baker F.	Pepper fruit	Nmimi	Annonaceae	Shrub	Forest
11	<i>Dialium guineensis</i> Willd	Tumble tree	Nkwa	Fabaceae	Tree	Forest
12	<i>Diospyros barteri</i> Hiern	-	Nkpukpa	Ebenaceae	Shrub	Forest
13	<i>Garcinia cola</i> Heckel	Bitter kola	Akirilu	Clusiaceae	Tree	Forest
14	<i>Irvingia gabonensis</i> (Baill. ex Lanen)	Bush mango	Agbolo	Irvingiaceae	Tree	Forest
15	<i>Icacina manii</i> Oliv.	-	Kpenbum kpenbum	Icacinaceae	Shrub	Forest fringe
16	<i>Icacina senegalensis</i> A. Juss.	False yam	Kpenbum kpenbum	Icacinaceae	Shrub	Forest fringe
17	<i>Landolphia dulcis</i> (R.Br.) Pichon	Sweet landolphia	Nkitokwa	Apocynaceae	Climber	Forest
18	<i>Landolphia owariensis</i> P.Beauv.	White rubber vine	Utu	Apocynaceae	Climber	Forest

19	<i>Lavigeria macrocarpa</i> (Oliv.) Pierre	-	Otubehi	Icacinaceae	Climber	Forest
20	<i>Maesobotrya barteri</i> var. <i>sparsifolia</i> (Sc. Elliot) Keay	Bush cherry	Ubena	Phyllanthaceae	Shrub	Forest
21	<i>Maesobotrya floribunda</i> var. <i>vermueleni</i> (De Wild.) J. Le'onard	Bush cherry	Ubena	Phyllanthaceae	Shrub	Forest
22	<i>Myrianthus arboreus</i> P. Beauv	Monkey fruit	Ujuju	Cecropiaceae	Tree	Forest
23	<i>Pentaclethra macrophylla</i> Bth.	Oil bean	Ugbakala	Fabaceae	Tree	Forest
24	<i>Salacia whytei</i> Loes	-	Otubehi	Celasteraceae	Shrub	Forest
25	<i>Solanum nigrum</i> Linn.	Black nightshade	Achichinnunu	Solanaceae	Herb	Forest
26	<i>Solanum torvum</i> Sw.	Pea egg plant	Nshirima	Solanaceae	Shrub	Forest
27	<i>Tristemma hirtum</i> P. Beauv.	-	Araraa	Melastomataceae	Herb	Forest
28	<i>Spondias mombin</i> Linn.	Hog plum	Ogogo	Anacardiaceae	Tree	Forest
29	<i>Steculia tragantha</i> Lindl.	African traganth	-	Malvaceae	Tree	Forest
30	<i>Syzygium guineense</i> (Willd.) DC.	Water berry	-	Myrtaceae	Shrub	Forest
31	<i>Tetracarpidium conophorum</i> (Mull.Arg) Hutch, Dalziel	Conophor	Ukpa	Euphorbiaceae	Climber	Forest
32	<i>Thaumatococcus danielli</i> (Benn.) Benth.	Miraculous fruit	-	Marantaceae	Shrub	Forest
33	<i>Treculia africana</i> Decne	African breadnut	Ukwa	Moraceae	Tree	Forest
34	<i>Tristemma hirtum</i> P. Beauv.	-	Araaraa	Melastomataceae	Shrub	Forest
35	<i>Uvaria chamae</i> P. Beauv.	Finger root	Nmimimuo	Annonaceae	Shrub	Forest
36	<i>Xylopia aethiopica</i> (Dunal) A. Rich.	African pepper	Uda	Annonaceae	Tree	Forest

Table 2: Marketable Indigenous Edible Wild Fruits (IEWFs)

S/N	Scientific Name	Local Name	Species sold in local market	Domesticated species	Locality
1	<i>A. melegueta</i>	Ose oji	√	√	Chokocho
2	<i>A. patinoides</i>	Araraa	×	×	Akwuobuo
3	<i>A. altilis</i>	Jibekee	√	√	Chokocho
4	<i>C. albidum</i>	Udara	√	√	Okehi
5	<i>C. hetrophylla</i>	Nkpishiraka umushii	×	×	Ozuzu
6	<i>C. millenii</i>	Ukukuru	×	×	Isu
7	<i>C. nitida</i>	Oji	√	√	Umuoye
8	<i>C. pachycarpa</i>	Ayaaya	√	√	Okehi
9	<i>C. edulis</i>	Ukpa	√	√	Ozuzu
10	<i>D. tripetala</i>	Nmimi	√	√	Odufor
11	<i>D. guineensis</i>	Nkwa	√	√	Okehi
12	<i>D. barteri</i>	Nkpukpa	×	×	Okehi
13	<i>G. cola</i>	Akirilu	√	√	Obibi
14	<i>I. gabonensis</i>	Agbolo	√	√	Umuoye
15	<i>I. manii</i>	Kpenbumkpenbum	×	×	Ndashi
16	<i>I. senegalensis.</i>	Kpenbumkpenbum	×	×	Odufor
17	<i>L. dulcis</i>	Nkitokwa	×	×	Ndashi
18	<i>L. owariensis</i>	Utu	√	√	Umuoye
19	<i>L. macrocarpa</i>	Otubehi	×	×	Ozuzu
20	<i>M. barteri</i>	Ubena	√	×	Okehi
21	<i>M. floribunda</i>	Ubena	√	×	Okehi
22	<i>M. arboreus</i>	Ujuju	√	√	Odufor
23	<i>P. macrophylla</i>	Ugbakala	√	√	Obite
24	<i>S. whytei</i>	Otubehi	×	×	Ndashi
25	<i>S. nigrum</i>	Achichi nnunu	×	×	Isu
26	<i>S. torvum</i>	Nshirima	×	×	Obibi
27	<i>T. hirtum</i>	Araraa	×	×	Isu
28	<i>S. mombin</i>	Ogogo	√	√	Obite
29	<i>S. tragantha</i>	-	×	×	Ozuzu
30	<i>S. guineense</i>	-	×	×	Isu
31	<i>T. conophorum</i>	Ukpa	√	√	Obite
32	<i>T. danielli</i>	-	×	×	Ozuzu
33	<i>T. africana</i>	Ukwa	√	√	Obibi
34	<i>T. hirtum</i>	Araaraa	×	×	Ozuzu
35	<i>U. chamae</i>	Nmimi nmuo	√	×	Obite
36	<i>X. aethiopica</i>	Uda	√	×	Ozuzu

Note: √ symbolizes “Yes” while × symbolizes “Nil”

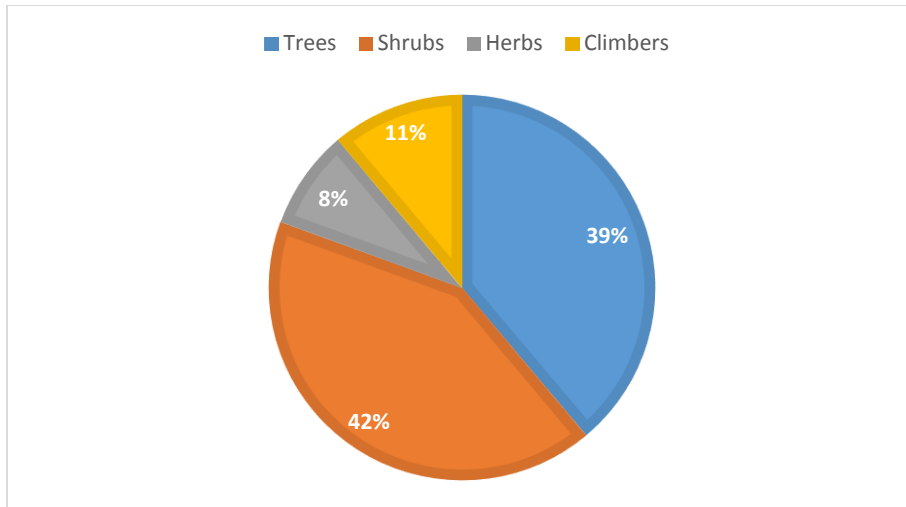


Fig. 2: Percentage Composition of IEWFs in Etche Sacred Forests



Figures 1 – 4: Photographs of some Indigenous Edible Fruits in Etche (1) *Sphenocentrum jollyanum* Pierre, (2) *Maesobotrya floribunda* var. *vermueleni* (De Wild.) J. Le'onard, (3) *Icacina manii* Oliv., and (4) *Pentaclethra macrophylla* Benth.

DISCUSSION

This investigation revealed that Etche Local Government Area is blessed with edible wild plants. However, the rate of consumption of Indigenous Edible Wild Fruits (IEWFs) has reduced compared to the past. Consequently, some of the rural dwellers do not know the names of these invaluable plant species. This agrees with the findings of Yangdon *et al.* (2022) who reported a reduced consumption of wild edible fruits resulting to a threat in wild food culture and its associated indigenous knowledge in Bhutan. Therefore, it is germane to focus on promoting these neglected plant species before the culture of consumption of IEWFs disappears.

Adeagbo *et al.* (2020) documented *D. guineense*, *D. tripetala*, *G. cola*, *I. gabonensis* and *T. africana* as some of the wild edible fruits of Ido-Osi Local Government Area of Ekiti State. Similarly, in our findings *D. guineense*, *D. tripetala*, *G. cola*, *I. gabonensis*, *T. africana* are not only edible wild fruits for household consumption but also sold in the local market for income. Also, Adeagbo *et al.* (2020) noted that *T. africana* and *A. altilis* are boiled before consumption. This report is also in line with our findings that *A. altilis* and *T. africana* are usually not eaten raw but boiled before it can be eaten.

It was observed that some of the IEWFs have diverse alternative uses other than the edibility of the fruits. Olalekun *et al.* (2003) documented that *S. mombin* fruits have various uses, its fruits are usually consumed fresh or processed and are generally accepted for their unique sweet-sour taste. The same fruits are used to treat angina, stomach ulcer, vaginal and uterine disorder; the squeezed fruit juice is taken as heart tonic in Brazil. In our studies, *S. mombin* fruits are eaten raw while the leaves are given to goats after baby delivery to ease placental movement. Similarly, our findings showed that other wild plants such as fruits of *Salacia whytei*, a shrub locally called "Otubehi" are edible and also used for the treatment of malaria; fruits

of *L. dulcis* locally called "Nkitokwa" are edible while its roots are used in the treatment of poor libido and body weakness. Abu *et al.* (2018) in a review of secondary metabolites of *Uvaria chamae* reported that all parts of *U. chamae* are fragrant. This fragrance could be responsible for attracting its desire for consumption. Our findings showed that fruits of *U. chamae* are consumed as a bush fruit whereas its roots are used to cook pepper soup to flush out blood remnants from a woman after child delivery.

In addition, a majority of the fruit plants remain exclusively in the wild (undomesticated). Etche people suffer from severe deforestation/forest depletion including some parts of the sacred forests, therefore there is a great threat to the habitat of these plants especially as they are still harvested exclusively in the wild. Several plant species would be more endangered and threatened with extinction if they are neglected without conservative and cultivation measures. This agrees with the findings of Gada and Ismaila (2021) who assessed some selected Edible Wild Fruits (EWFs) as potential remedy to malnutrition in the rural areas of Sokoto State, Nigeria. Wilcox (1995) and UNEP (2011) reported that anthropogenic activities such as deforestation, building constructions and bush burning for farming activities constitute a threat to plant species in Niger Delta. This agrees with our observations that plant species such as *M. arboreus*, *D. guineensis*, *C. millenii*, *D. barteri*, *S. guineense*, *S. torvum*, *L. owariensis* and *U. chamae* are threatened edible wild species in the parts of Etche under study.

Syzygium guineense and *V. doniana* were reported by Alebel and Mohammed (2021) as some of the widely utilized and marketed priority wild edible fruit species for domestication and improvement in Ethiopia. In our findings, fruit plants such as *A. altilis*, *A. melegueta*, *M. arboreus*, *D. guineensis*, *L. owariensis* and *U. chamae*, *C. albidum*, *Cola nitida*, *C. pachycarpa*, *C. edulis*, *D. tripetala*,

G. cola, *I. gabonensis*, *T. conophorum*, *T. africana*, and *X. aethiopica* are consumed locally and also traded in the market as a household source of income whereas *A. patinoides*, *C. hetrophylla*, *C. millenii*, *D. barteri*, *M. barteri var. sparsifolia* etc. are not sold in the local market but consumed locally within the household as at the time of this investigation. Most peasant farmers in Etche depend on the IEWFs obtained from the forest to cater for their families and other exigencies.

CONCLUSION

Etche Local Government Area has a rich diversity of IEWFs but the rate of their consumption has dwindled recently. Predominant farming practices of the people which includes deforestation and bush burning constitute a threat to these economic plants. The current situation of these invaluable plants calls for enhancement of their conservation.

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