

Ethnobotanical Survey of Plants in Andoni Local Government Area of Rivers State, Southern Nigeria

Ubelejit Alfred^{1*}, Adoyi Paul², Sunday Ameh², Yakubu Danjuma³

^{1,2}Department of Plant Science and Biotechnology, University of Agriculture, Makurdi, Benue State, Nigeria

³Department of Biochemistry, University of Agriculture, Makurdi, Benue State, Nigeria

Corresponding author: *ajubelejit@gmail.com

Abstract: Ethnobotanical survey of plants in Andoni Local Government Area of Rivers State, Southern Nigeria was carried out with the aim of identifying and documenting different plant species of Ethnoeconomic and Ethnomedicinal importance used by this people to enrich their lives and solve their health problems. The knowledge of these plants used by this people was gained through the administration of well-structured questionnaires, in-depth interactions with herbalist in the area, field trips with herbalist and some selected locals, organized group discussions and literature review. A total of 116 persons (16 herbalist and 100 locals) from 16 villages were sampled during the survey period. The survey revealed that a total of 65 plant species distributed into 37 families have major Ethnoeconomic and Ethnomedicinal importance to this people. Thirty-five (35) plant species distributed into 27 families have major Ethnoeconomic usage, 15 plant species distributed into 11 families have Ethnomedicinal usage while 15 plant species distributed into 13 families have combined Ethnoeconomic and Ethnomedicinal usage. For all the plant species documented, those belonging to the family Aracaceae have the highest usage (17%) followed by those in the family Asteraceae (14%). Percentages of parts used for all the documented plant species shows that the leaves have the highest usage (31.18%) followed by fruits (27.96%), whole plant (13.98%), stem (12.90%), bark (5.38%), tubers (4.30%), seeds (3.23%) and roots (1.08%). The usefulness of this documented information towards the conservation of the natural heritage of the Andoni man and his biodiversity is also elaborated by this survey.

Keywords: Andoni, Ethnobotany, Ethnobotanical, Ethnoeconomical, Ethnomedicinal.

1. INTRODUCTION

Ethnobotany is an aspect of human ecology that defines the link between people and the plants around them [14]. It is very significant in that its practical implications are the understanding of indigenous food production [26] and the documentation of traditional botanical knowledge [25]. There are three major fields of ethnobotany. The first one (basic) involves the documentation of traditional botanical knowledge; the second (quantitative) involves the evaluation of use-values, relative use-values, proportion of agreement and preference ranking [5], [5]; and the third (experimental) involves the assessment of benefits, hypothesis testing and prediction [3]. In Nigeria, Ethnobotanical studies were initially carried out to reflect the first field of ethnobotany (basic) and hence, centered on the uses of plants by different ethnic groups [11], [4]. Later on, specific research works, classified as ethnomedicine, ranging from plants used in the management of arthritis [20], sickle cell anemia [9], [16], sexually transmitted infections [17], breast cancer [18], infant illnesses [7], to skin infections [1], [21], [12] etc. were conducted and reported to cover the second field of ethnobotany (quantitative). Lately, there has been a shift in emphasis from free-listing and systematic botany to a nexus between ethnomedicine and phytochemistry [19], [13], [20], [8], [6], [22] [15]. This recent shift in emphasis is accounted for by the third field of ethnobotany (experimental).

2. MATERIALS AND METHODS

Study Area:

Andoni is a Local Government Area in Rivers State, Southern Nigeria. Its headquarters is in the town of Ngo. It has an area of 233km² and a population of 211,009 at the 2006 census. Andoni is bounded by the Atlantic Ocean on the south, the Ogonis on the north, Bonny on the west and Akwa-Ibom State on the east. The primary means of transportation is by water and fishing is their traditional occupation.

Collection of Information:

Ethnobotanical information was collected for economic and medicinal plants from 16 villages (Ngo, Ebukuma, Ikuru, Ataba, Ekede, Agwut-Obolo, Asarama, Unyeada, Dema, Ajakajak, Agana, Ayanboko, Okoroboile, Egwede, Isi-ama and Ilotombi). The survey of Economic plants was done by administering questionnaires to randomly selected Locals within the age bracket of 20 to 60 years. A total of 100 persons were interviewed and among this number a few individuals were taken to the field to identify the plants whose local names were written down. The identified plants were then photographed for further identification and verification of their family, botanical and common names. The survey of medicinal plants encompass staying with 16 renowned herbalist in the area, administering questionnaires to them, going to the field with them to photograph and obtain plant species that they make use of, learning the preparation processes and techniques and taking into cognizance the dosage administered and the diseases they cure. During the survey, local names of plants, location, uses, parts used, preparation and dosage administered were recorded. Also, the identification of recorded plant species covering their family, botanical and common names were done with the help of some published literatures and by reference to the University of Port Harcourt herbarium (UPH).

Data Analysis:

The data collected on the uses of plant species documented, parts used and the health challenges that they address was entered into excel worksheets and the percentages were calculated and represented with pie charts.

3. RESULTS

Table 1 shows plants with Ethnoeconomic uses only. The information contained in this table include: species and family name, local and common name, location, part used and uses. In this category, plants belonging to the family Aracaceae have the highest usage (14.3%) followed by those in the family Poaceae, Gnetaceae, Musaceae and Sterculiaceae with 5.7 % usage each. For parts of the plant used, fruits have the highest percentage (50.0%), followed by stem (18.4%), leaves (15.8%), seeds (7.9%), tubers (5.3%) and then whole plant (2.6%). Table 2 shows plants with Ethnomedicinal uses only. Information contained in this table shows that plant species belonging to the family Asteraceae have the highest usage (26.7%) followed by those in the family Poaceae (13%). Percentages of the parts of the plants used shows that the leaves have the highest usage (73%), followed by the whole plant (13%) while the fruits and tubers come last with a percentage of 7% respectively. Table 3 shows plants with combined Ethnoeconomic and Ethnomedicinal uses. In this category, plants in the family Rutaceae and Euphorbiaceae have the highest usage (13.3%) respectively followed by those in the family Caricaceae (6.7%). Percentages of usage of various parts showed that leaves have 38.70% to place highest, followed by bark and stem at 16.13% respectively. Others include fruits (19.35%), tubers (3.23%), roots (3.23%) and whole plant (3.23%). A combination of the information in table 1, 2 and 3 shows that plants in the family Aracaceae have the highest usage (17%), followed by those in the family (Asteraceae). For the percentages of parts generally used for all the plant species documented, leaves have the highest (31.18%), followed by fruits (27.96%), whole plant (13.98%), stem (12.90%), bark (5.38%), tubers (4.30%), seeds (3.23%) and roots (1.08%).

Table 1: Documentation of plants with Ethnoeconomic uses

S/N	Species and family name	Local and common name	Part used and Location	Preparation	Uses
1	<i>Nypa fruticans</i> Wurmb (Arecaceae)	Ude (Nipa palms)	Leaves (Ngo)	The leaves are wrapped around sticks (Ogaa)	Roofing and covering of huts
2	<i>Bambusa vulgaris</i> Schrad ex Wendel (Poaceae)	Ngwor ebeke (Bamboo)	Stem (Ngo)	The stem are dissected and dried	Hut construction

3	<i>Raphia hookeri</i> Mann & Wendland (Arecaceae)	Igaan (Raphia palm)	Stem (Ngo)	The young stem is harvested and bisected to make sizable racks (Akasi)	Drying of fishes
4	<i>Crescentia cujete</i> L (Bignoneaceae)	Ogbokot (Calabash tree)	Fruit (Ekede)	The matured fruit is bored open at the top and its content removed	Fishing calabash
5	<i>Gnetum africanum</i> Fumbwa in Lingala (Gnetaceae)	Afang (Afang)	Leaves (Ekede)	The leaves are harvested and grounded	Cooking
6	<i>Irvingia gabonensis</i> (Aubry-Lecomte ex O'Rorke) Baillon (Ixonanthaceae)	Obonor (Wild mango)	Seeds (Ebukuma)	The seeds are harvested and grounded	cooking
7	<i>Mucuna pruriens</i> (L) DC. Var. utilis (Wall ex Wight) Baker ex Burck (Fabaceae)	Ukpor (Velvet bean)	Seeds (Ekede)	The seeds are gotten from the pods and then grounded	cooking
8	<i>Telfairia occidentalis</i> Hook. F. (Cucurbitaceae)	Iwan ngbon (Fluted pumpkin)	Leaves (Ebukuma)	The leaves are harvested and chopped in pieces	Cooking
9	<i>Gnetum buchholzianum</i> Engl. (Gnetaceae)	Aritat	Leaves (Ekede)	The leaves are harvested and grounded	Cooking
10	<i>Elaeis guineensis</i> Jacq (Arecaceae)	Coo (Palm tree)	Fruits and leaves (Ikuru)	The ripe fruits are processed into palm oil and the leaves into broom	Cooking and broom making
11	<i>Musa paradisiaca</i> Linn (Musaceae)	Ata ofong (Plantain)	Fruit and psudostem (Ikuru)	The ripe fruit is harvested while the psudostem is dissected to form ropes	Eaten and ropes for binding fish racks.
12	<i>Musa sapientum</i> Linn (Musaceae)	Ofiong ebeke (Banana)	Fruits and psudostem (Ikuru)	The ripe fruit is harvested while the psudostem is dissected to form ropes	Eaten and ropes for binding fish racks.
13	<i>Dissotis congolensis</i> (Congn. Ex Buttner) Jacq-fel (Melastomataceae)	Bobo-odrey	Fruits (Ekede)	The ripe fruits from the plant are harvested	Eaten
14	<i>Maesobotrya barteri</i> (Baill.) Hutch (Euphorbiaceae)	Iyantot (Bush chery)	Fruits (Ekede)	The ripe fruits of the plant are harvested	Eaten
15	<i>Phoenix reclinata</i> Jacq (Arecaceae)	Asark (Senegal date palm)	Fruits (Ekede)	The ripe fruits of the plant are harvested	Eaten
16	<i>Annona muricata</i> L. (Annonaceae)	Chichopri (Sour sop)	Fruits (Ataba)	The ripe fruits of the plant are harvested	Eaten
17	<i>Cola acuminata</i> (P. Beauv.) Schott & Endl. (Sterculiaceae)	Ebon (Kola nuts)	Fruits (Agwut-Obolo)	The fruits from the plant are harvested	Eaten
18	<i>Bligha sapida</i> Koenig (Sapindaceae)	Ekpe-Iboo (Akee apple)	Fruits (Ataba)	The ripe fruits from the plant are harvested	Eaten
19	<i>Xanthosoma mafaffa</i> Schott (Araceae)	Ikpon (Coco yam)	Tubers (Asarama)	Mature tubers are harvested and cooked	Eaten
20	<i>Artocarpus altilis</i> (Parkinson) Fosberg (Moraceae)	Okwa-ebeke (Breadfruit)	Seeds (Uyeada)	Ripe fruits are harvested and dissected to get the seeds	Eaten
21	<i>Costus lucaianus</i> Braun & Schum (Costaceae)	Nfon (Bush cane)	Fruits (Asarama)	The ripe fruits are harvested	Eaten
22	<i>Chrysophyllum albidum</i> G. Don (Sapotaceae)	Udan (Star apple)	Fruits (Uyeada)	The fruits of the plant are plucked when ripe	Eaten

23	<i>Dacryodes edulis</i> (G. Don) Lam. (Burseraceae)	Ube (African pear)	Fruits (Dema)	The ripe fruits of the plant are plucked, washed and boiled	Eaten
24	<i>Ananas comosus</i> (L) Merr. (Bromeliaceae)	Ulaza ebeke (Pineapple)	Fruits (Ajakajak)	Matured fruits are harvested and peeled	Eaten
25	<i>Zea mays</i> L. (Poaceae)	Akpaa (Corn)	Fruits (Agana)	Matured fruits are harvested, peeled and cooked	Eaten
26	<i>Cola Lepidota</i> K. Schum (Sterculiaceae)	Nziza (Monkey Kola)	Fruits (Ekede)	Matured fruits are harvested and peeled	Eaten
27	<i>Dioscorea rotundata</i> Poir (Dioscoreaceae)	Ukwaa (White Guinea yam)	Tubers (Ayanboko)	Matured tubers are harvested, peeled and cooked	Eaten
28	<i>Anacardium occidentale</i> L (Anacardiaceae)	Cashew (Cashew)	Fruits (Okoroboile)	The fruits are plucked, washed and licked	Eaten
29	<i>Persea Americana</i> Mill. (Lauraceae)	Ube ebeke (Avocado)	Fruits (Egwede)	The fruits are harvested and bisected to remove the seed	Eten
30	<i>Raphia Africana</i> Otedoh (Areaceae)	Minobolo (Rafia palm)	Whole plant (Isi-ama)	The plant is tapped for its wine	Palm wine
31	<i>Rhizophora sp.</i> L (Rhizophoraceae)	Ngaala (Red mangrove)	Stem (Ilotombi)	The stem are cut and kept for them to lose moisture	Fuel and charcoal making
32	<i>Abelmoschus esculentus</i> (L) Moench (Malvaceae)	Edeke Okra	Fruits (Ayanboko)	The fruits are harvested and sliced	Cooking
33	<i>Talinum triangulare</i> (Jacq) Willd (Portulacaceae)	Iwanmu (Water leaf)	Leaves (Agana)	The leaves are harvested and chopped into smaller sizes	Cooking
34	<i>Allocasuarina torulosa</i> (Aiton) L.A.S Johnson (Casuarinaceae)	Iye	Stem (Okoroboile)	The stems are harvested and dissected into smaller sizes	Firewood
35	<i>Milicia excelsa</i> (Welw) C.C Berg (Moraceae)	Otiile African teak	Stem (Ajakajak)	The stem is harvested and cut in pieces	Firewood and carvings

Table 2: Documentation of plants with Ethnomedicinal uses

S/N	Species and Family name	Local and Common name	Parts Used and Location	Diseases cured	Preparation	Dosage Administered
1	<i>Chromolaena odorata</i> L. (R.M. King & Robinson) (Asteraceae)	Awaolowo (Christmas bush)	Leaves (Ilotombi)	Dysentery and drunkenness	Extracts from the leaves is collected in a cup of water	Extracts from 4 to 10 leaves is administered
2.	<i>Colocasia esculenta</i> (L) Schott & Endl. (Araceae)	Ikon Oron (Wild cocoyam)	Tubers or roots (Egwede)	Rashes	Tubers or roots are grounded into powdery form	A little quantity is applied on the affected area
3	<i>Dioscorea villosa</i> Linn (Dioscoreaceae)	Ukwa oron (Wild yam)	Leaves (Isi-ama)	Arthritis	The leaves are properly grounded and used	Apply on the affected area
4	<i>Ageratum conyzoides</i> L. (Asteraceae)	Atramba or Akpan nsabon (Goat weed)	Leaves (Okoroboile)	Heart problem	Leaves are folded into a bottle of dry gin	A cup full is administered 3 times daily
5	<i>Aloe vera</i> (L.) Brum. F (Xanthorrhoeaceae)	Aya ugwu (Aloe vera)	Leaves (Agana)	Ringworm and rashes	Content of the leaves is carefully scrap into a container	Applied on the affected area after every bath

6	<i>Synedrella nodiflora</i> (L.) Gaertn. (Asteraceae)	Ukan oron (Cindrella weed)	Leaves (Ayanboko)	Dysentery	Extracts from 4 to 10 leaves is collected in a cup of water	Administered 3 times daily
7	<i>Senna alata</i> (L) Roxb. (Fabaceae)	Gwon iwan (Ringworm tree)	Leaves (Ajakajak)	Cough, ringworm and rashes	10 to 15 leaves are plucked, chewed for cough or grounded for ringworm and rashes	Chewed once a day or applied twice a day to the affected area
8	<i>Emilia sonchifolia</i> (L) DC. (Asteraceae)	Ugwu ukan (Emilia)	Leaves (Dema)	Fever	Extracts from 3 leaves are collected	A drop from each leaves is applied into the eyes, ear and nose
9	<i>Heliotropium indicum</i> L. (Boraginaceae)	Afaar (Indian heliotrope)	Leaves (Uyead)	Headache and bleeding	Extracts from the leaves are collected	A drop into the eyes for headache and a few drops on cuts or wounds is used
10	<i>Azadirachta indica</i> A. Jussieu (Meliaceae)	Ugwu nkpu (Neem tree)	Leaves (Asarama)	Malaria	The leaves are harvested and then cooked for 30 to 45 minutes	A cup full is administered twice a day
11	<i>Dennettia tripetala</i> Baker fil (Annonaceae)	Nkirika (Pepper fruit)	Fruits (Ebukuma)	Sore throat	The fruits are collected, washed and stored	Two fruits are chewed daily
12	<i>Kalanchoe pinnata</i> (Lam) (Crassulaceae)	Ikpikiri (African never die)	Leaves (Ataba)	Convulsion And cough	The leaves are kept over fire to get warm and then used	Contents of 2 to 4 leaves are squeezed into the mouth
13	<i>Phyllanthus amarus</i> Schum & Thonn (Euphorbiaceae)	Ugwu oron (Gulf leaf flower)	Whole plant (Agwut-Obolo)	Malaria	The plant is uprooted, washed and cooked for 30 to 40 minutes	Two cup full is administered twice a day
14	<i>Cymbopogon citratus</i> (Poaceae)	Iwan Odosi (Lemon grass)	Leaves (Ikuru)	Malaria	The leaves are combined with spear grass and the leaves of Mango and cooked for 45 minutes	A cup of the mixture is administered trice a day
15	<i>Heteropogon contortus</i> (L) Beauv. Ex Roem & Schult (Poaceae)	Iwan nkpu (Spear grass)	Whole plant (Ngo)	Malaria	The plant is mixed with gulf leaf flower and cooked for 50 minutes	A cup of the mixture is administered twice a day

Table 3: Documentation of plants with combined Ethnoeconomic and Ethnomedicinal uses

S/N	Scientific name and Family	Local and Common name	Parts used and Location	Uses and diseases cured	Preparation	Dosage administered
1	<i>Citrus aurantifolia</i> Linn (Rutaceae)	Ulaza agbro (Bitter orange)	Fruits (Ajakajak)	Stomach ache and licking	Matured fruits are plucked and peeled	2 to 4 fruits are taken twice a day
2	<i>Citrus lemon</i> Linn (Rutaceae)	Odosi (Lime)	Leaves and fruits (Agana)	Dysentery, stomach upset and licking of the fruits	Leaves are cooked for 30 to 45 minutes while fruits are peeled	2 cup full of cooked leave mixture are administered twice a day

3	<i>Manihot esculenta</i> Crantz (Euphorbiaceae)	Kenge (Cassava)	Leaves and tubers (Ayanboko)	Drunkenness and garri processing	5 to 10 leaves are squeezed into a cup of water. Tubers are processed into garri	A cup full is administered
4	<i>Carica papaya</i> Linn (Caricaceae)	Akput (Pawpaw)	Leaves and fruits (Okoroboile)	Skin burn and eating of the fruits	The leaves are squeezed into a bowl of water. Ripe fruits are harvested	The water is used to bath victims of fire hazard
5	<i>Psidium guajava</i> Linn (Myrtaceae)	Gwova (Apple guava)	Leaves, tap root and fruit (Egwede)	Dysentery, sexual weakness and eating of the fruits	Fresh leaves are plucked, tap root is dissected and boiled while ripe fruits are harvested	Leaves are chewed for dysentery and water from tap roots is taken for sexual weakness
6	<i>Cocos nucifera</i> Linn. (Aracaceae)	Ichip (Coconut)	Bark of stem and fruit (Isi-ama)	Toothache, drunkenness and eating of the fruits	Bark of the stem is boiled for 30 to 45 minutes and matured fruits are harvested	Water from the bark is used to wash the mouth twice a day for toothache and water from the fruits is taken for drunkenness
7	<i>Alchornea cordifolia</i> Mull. Arg (Euphorbiaceae)	Obubu (Christmass bush)	Leaves and stem (Ebukuma)	Dysentery and hut construction with the stems	5 to 10 leaves are squeezed into a cup of water and the stems are harvested	Water is taken to stop dysentery
8	<i>Newbouldia laevis</i> (P Beauv.) Seemann ex Bureau (Bignoniaceae)	Iwan egbe (Newbouldia)	Leaves and whole plant (Ekede)	Menstrual flow and boundary indication with the whole plant	Leaves are cooked for 45 to 55 minutes	The mixture is taken trice a day
9	<i>Vernonia amygdalina</i> Delile (Asteraceae)	Olibri (Bitter leaf)	Leaves (Ataba)	Stomach ache, diabetes and the leaves are used for cooking	Content of leave is squeezed into tea spoon	Two tea spoons are admistered trice a day for stomach ach and diabetes
10	<i>Costus afar</i> Linn (Costaceae)	Ngwor oron or Okpoto	Leaves and stems (Dema)	Internal heat and missile while stems are chewed	Content of 5 to 10 leaves are squeezed into a cup of water and stems are pounded	One tea cup is taken for internal heat while the grounded stem is applied on the skin for missile
11	<i>Mangifera indica</i> Linn (Anarcadiaceae)	Mangolo (Mango)	Leaves, bark and fruits (Uyeada)	Malaria and the ripe fruits are eaten	The leaves and bark are cooked together for 45 to 60 minutes	The mixture is taken trice daily
12	<i>Ocimum gratissimum</i> L. (Lamiaceae)	Ikani (Scent leaf or African basil)	Leaves (Agwut-Obolo)	Stomach upset, malaria and cooking	Content of 10 to 20 leaves are squeezed into a cup of water	The mixture is taken twice a day

13	<i>Morinda lucida</i> (Benth) (Rubiaceae)	Ogwu oron (English brimstone tree)	Leaf, stem and bark (Asarama)	Malaria, arthritis while stem is used as firewood	Leaves, stems and bark are cooked together for 45-60 minutes	The mixture is taken twice a day for both conditions
14	<i>Alstonia boonei</i> De Wild (Aocynaceae)	Utinkpok (Cheese wood)	Leaf, stem and bark (Ekede)	Malaria while the stem is used for carvings and firewood	The leaves, stem and bark are cooked together for 50 minutes	The mixture is administered trice a day
15	<i>Khaya grandifoliola</i> C.DC (Meliaceae)	Oti oron (African Mahogany)	Stem and bark (Ekede)	Malaria and the stem is used for carvings and firewood	The stem and bark are boiled together for 45 to 55 minutes	The mixture is administered three times daily

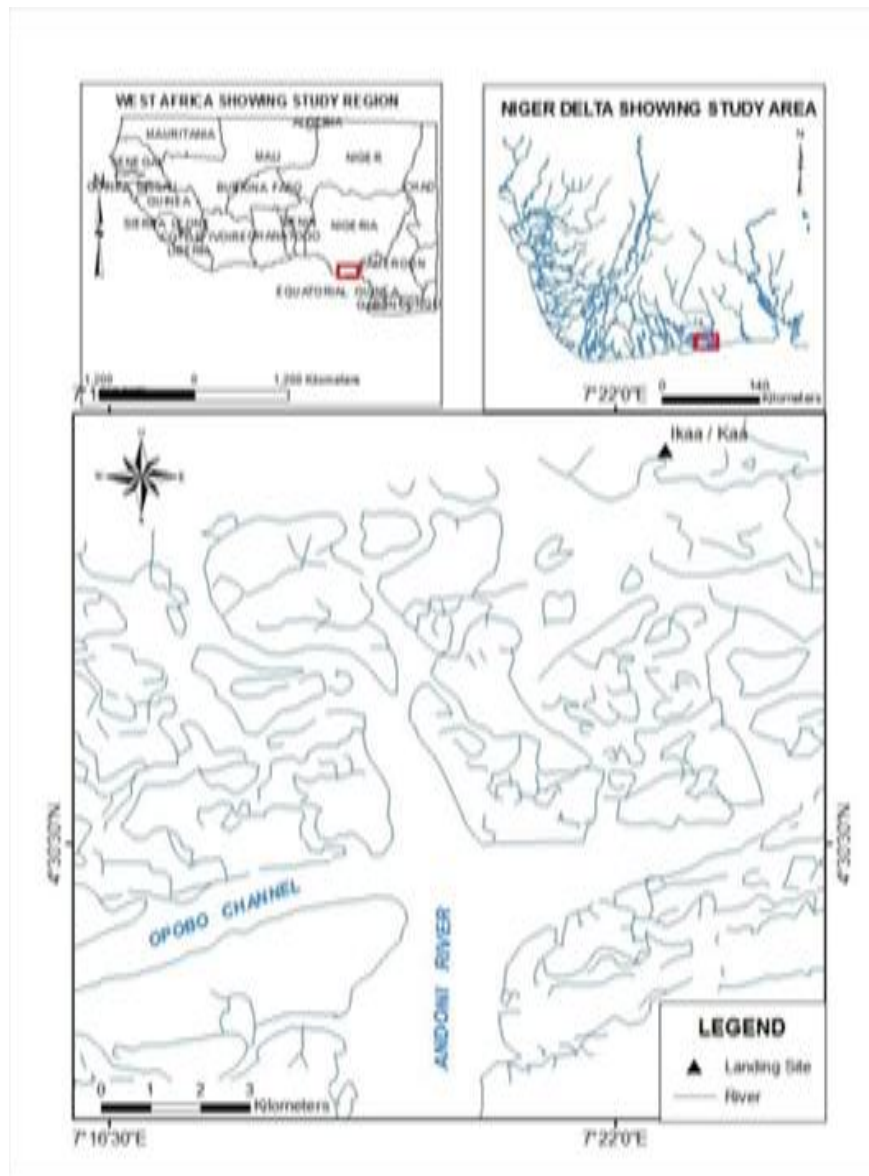


Figure 1: Map showing study Area

Source: Google map

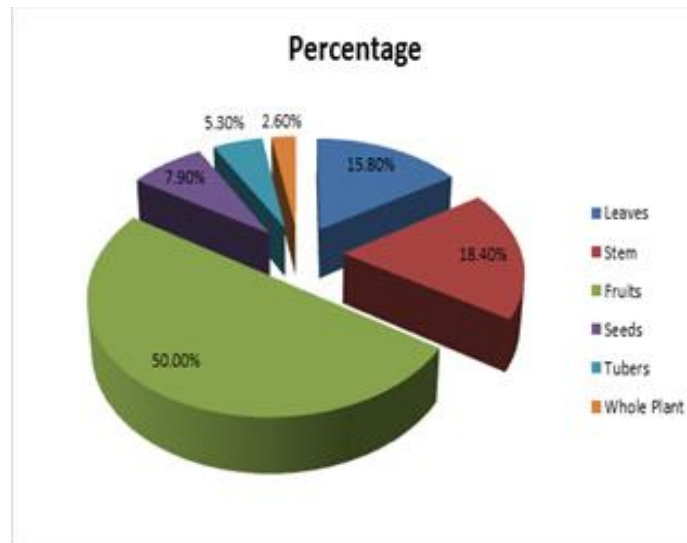


Figure 2: Percentages of parts used for Ethnoeconomic purposes

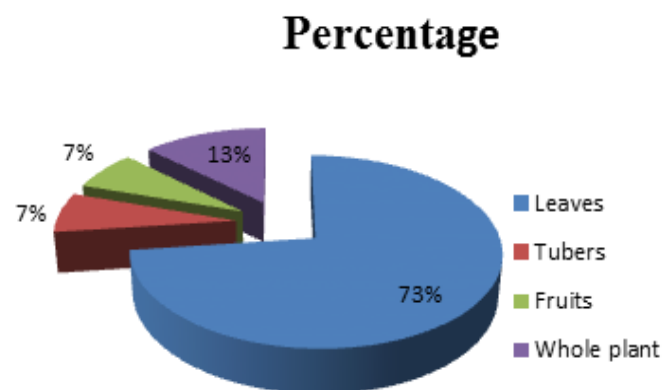


Figure 3: Percentages of parts used for Ethnomedicine

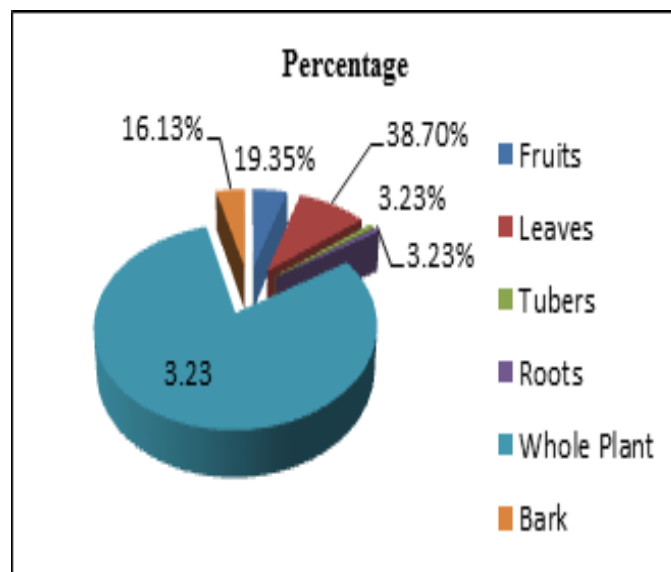


Figure 4: Percentages of parts used for combined Economic and Medicinal purposes

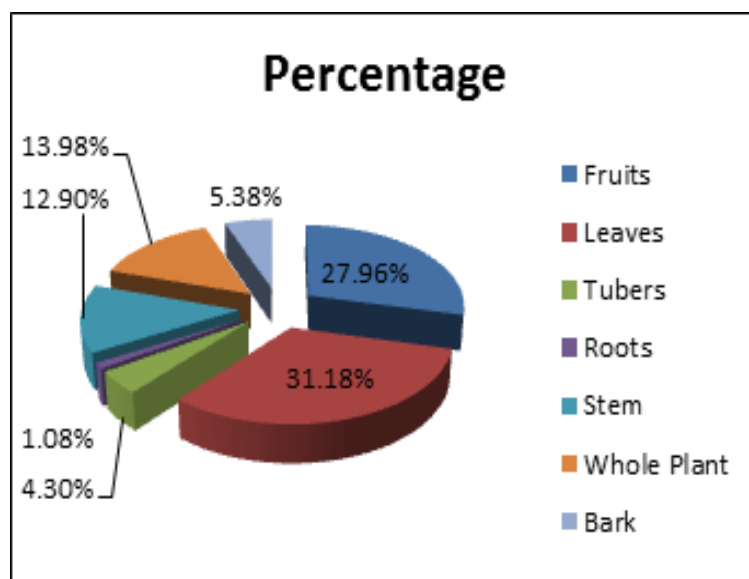


Figure 5: Summary of parts used for all the plants documented

4. DISCUSSION

This is the first Ethnobotanical survey of plants in Andoni Local Government Area of Rivers State in Southern Nigeria. The study shows that 65 plant species identified are useful as food and in the treatment of different ailments, proving that traditional medical practice and use of plants is an important component of our everyday life. Hence, [10] suggested that Government should encourage herbal medicine apprenticeship, establish traditional medicine department in all primary health care centers as well as herbal drug regulation, quality assurance and control also, that researchers should support host communities with benefits gained from the commercialization of pharmaceuticals. Ethnobotanical usage of plants is closely tied to the family in which plant species belong. For instance, studies have shown that plant species belonging to the family Asteraceae and Aracaceae are mostly used by the people in Rivers state [2] [24]. This fact is also confirmed by this survey which shows that plant species belonging to the family Aracaceae are mostly used followed by those in the family Asteraceae. Furthermore, in a study aimed at documenting the herbal plants used by the people of Port Harcourt metropolis, the parts used, how they are used and the type of ailment they cure, [24] were able to show that the bitter leaf plant (*Vernonia amygdalina*) is used as a remedy for stomach ache, while the mango plant (*Mangifera indica*), the neem plant (*Azadirachta indica*) and the pawpaw plant (*Carica papaya*) are used in the treatment of fever, anemia and diabetes respectively. These findings are in conformation with the result of this survey except for the fact that in Andoni Local Government Area, the pawpaw plant is basically used on skin burn. Also, [24] reported that plantain (*Musa paradisiaca*) is used to cure sexually transmitted diseases, to regularize menstruation and to increase fertility. However, this current survey revealed that the people of Andoni uses the Newbouldia plant (*Newbouldia laevis*) to regularize and stop prolonged menstruation and the guava plant (*Psidium guajava*) to increase sexual performance. In Andoni Local Government Area of Rivers State, the use of plants as medicine varies greatly from one village to another and even among traditional healers across the villages. Despite this variation of usage of plants, the fact still remains in line with [23] assertion that in Nigeria, traditional medicine is filling the gap of inequalities in access to healthcare and outcomes.

5. CONCLUSION

Man exists because plants exist around him. Let us therefore conserve nature's gift to us all, encourage more research in Ethnobotany for proper documentation and preservation of Ethnobotanic knowledge and Ethnomedicinal plants should also be taught as part of curriculum of medical and other related sciences.

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