

**DIVERSITY AND ABUNDANCE OF LESSER-KNOWN PLANT SPECIES OF  
FOOD AND ETHNOMEDICINAL POTENTIALS IN TROPICAL  
RAINFOREST ECOSYSTEM OF SOUTHWEST NIGERIA**

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**BY**

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# Outline

- Introduction
- Methodology
- Result and Discussion
- Conclusion and Recommendation



# INTRODUCTION

- Food insecurity is becoming rampant today.  

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- African countries are the most affected due to:
  - Poverty
  - Unemployment
  - population growth
  - government instability and unstable policies on agriculture, etc
- Farming has been relegated to the background as a result of oil boom.  

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## INTRODUCTION Cont.

- ❑ Most Nigerians now live mostly on cereals and other carbohydrate-rich food as they could not afford the exorbitant cost of animal protein .
  - ❑ Underutilized plants species in tropical rainforest ecosystem contain large quantity of proteins, minerals and vitamins.
  - ❑ They could augment the diet of many Nigerians (Africans) thereby preventing malnutrition and diseases susceptibility in children.
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## INTRODUCTION Cont.

□ Underutilized plant species of food potentials are under great threat of extinction as a result of Deforestation :

– over exploitation

-Encroachment

-clearance of natural forest for construction and establishment of large scale afforestation projects.

-Fire and overgrazing etc.

# Objectives

- ❑ Establish the present status of tropical rainforest ecosystem in term of tree specie diversity and abundance
  - ❑ Especially the diversity and abundance of lesser-known species in this ecosystem
  - ❑ This will assist in determining those that are rare, endangered and those that have gone into extinction.
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## Research Questions

- ❑ How many tree species in this ecosystem ~~(represented by those selected)?~~
- ❑ The spp are distributed among how many families?
- ❑ What proportion is of food, spices and medicinal values?
- ❑ What is the relative abundance of these categories of plants?

Research Questions cont.

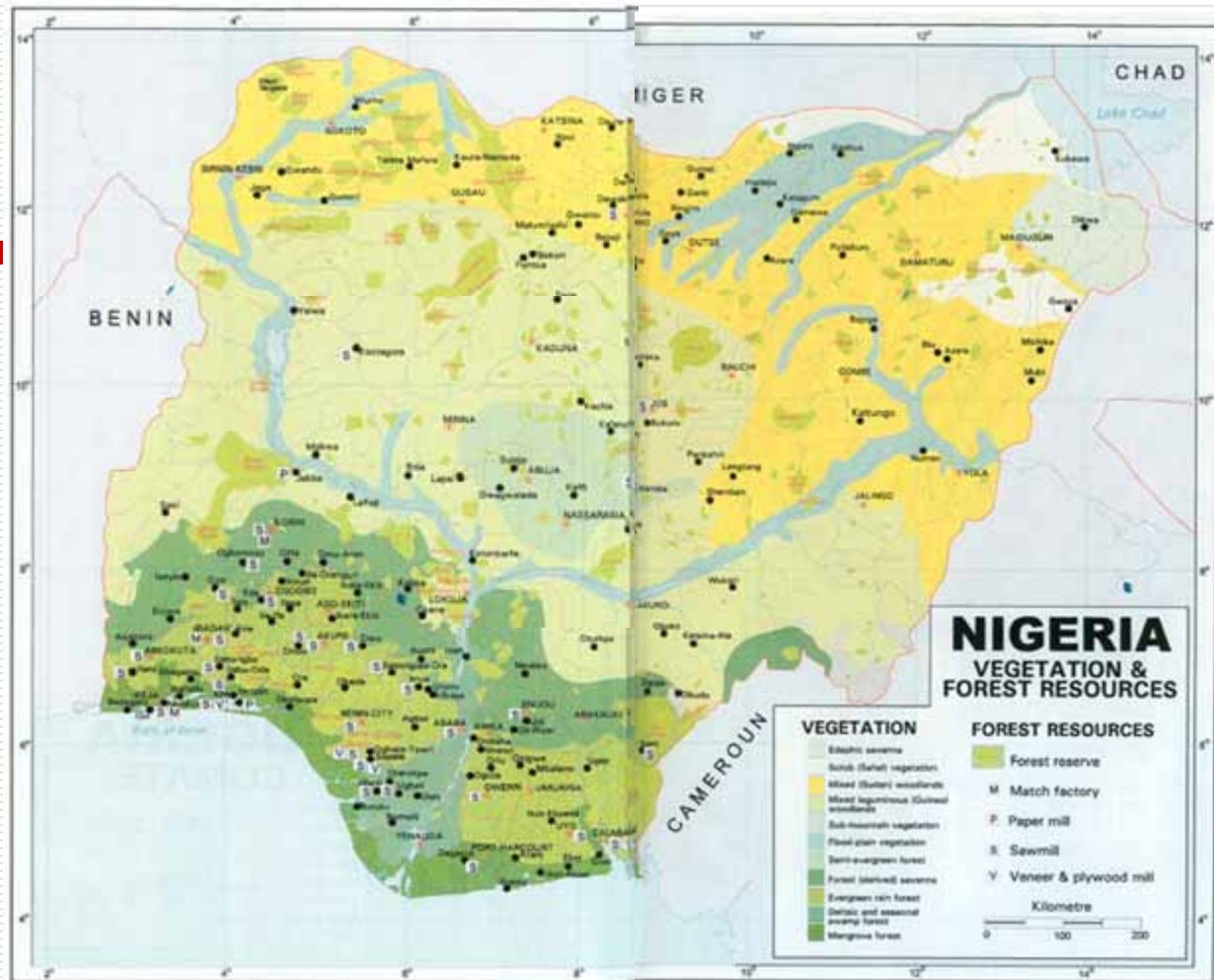
- ❑ What are their nutritive and medicinal values (Compare with the exotic ones)
  - ❑ Can an average Nigerian afford the price of the exotics?
  - ❑ How do we safe them from total extinction?
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## METHODOLOGY

- Site: The Tropical rainforest ecosystem of southwest Nigeria was used.
- Four forest reserves distributed in three states were randomly selected:
  - Ala (Latitude  $6^{\circ} 45''$  and  $7^{\circ}$  N and Longitude  $5^{\circ}$  and  $5^{\circ} 10''$ ) and Akure in Ondo state,
  - Omo (latitude  $6^{\circ} 35'$  and  $7^{\circ} 05'$  N and longitude  $4^{\circ} 05'$  and  $4^{\circ} 40'E$ ) in Ogun State and
  - Shasha (Latitude  $9^{\circ} 4'$  and  $9^{\circ} 50'N$  and Longitude  $3^{\circ} 54'$  and  $4^{\circ} 6'E$ ) in Osun State.
- The sampling technique - systematic cluster sampling.
- Eight plots (50 x 50m) selected in each site



Map of Nigeria showing the 36 states & FCT



Vegetation & Forest Map of Nigeria

### **Method of data collection.**

- ❑ Identification of all three species with dbh > 10 cm were carried out in each plot.

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- ❑ The list of plant species with edible fruits, nuts, spices, and vegetable were obtained through interview schedule and literature.
- ❑ Literatures were also used for their morphological characteristics and nutritive values.
- ❑ Biodiversity indices were used for comparing biodiversity and as indication of biodiversity loss in the ecosystem.

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# RESULTS and discussion

Table 1: Summary of tree species diversity and distribution in the ecosystem

Site	No of Spp	No. of individual trees/ha	No of families	*H'	**E
Shasha FR	55	159	22	3.656	0.914
Ala FR	54	148	26	3.621	0.908
Omo FR	41	115	23	3.342	0.900
Akure FR	46	549	21	3.16	0.83
All sites	108	966	34	3.778	0.55

*\*H' - Shannon diversity index, \*\* E - Evenness*

## Results Cont.

Table 2: Selected economic uses of tree species and their relative abundance in the study area.

<b>Uses</b>	<b>No of individuals/ha</b>	<b>No of species</b>	<b>% Total no. of species found in the study area</b>
Timber	105	42	51.85
Medicinal	79	21	25.92
Edible fruits, nuts and condiment	54	15	18.52
Chewing sticks	5	4	4.94
Leaves for wrapping	4	2	2.47
Rubber, Resin and gum	28	19	23.46

*\*The total number of species across the three sites is 108 but it is discovered that some of the species have more than one uses.*

Results Cont.

**Table 3: Lesser-known tree species encountered in the ecosystem, their families, relative densities and distribution.**

S/N	Tree species	Family	Abundance/ ha	RD	<i>piLnpi</i>	Sites found
1	<i>Artocarpus altilis (EF)</i>	Moraceae	2	0.19	-0.012	4
2	<i>Blighia sapida (EF)</i>	Sapindaceae	2	0.19	-0.012	1
3	<i>Canarium schweinfurthi (EF)</i>	Burseraceae	1	0.10	-0.007	3
4	<i>Ceiba pentandra (VEG)</i>	Bombaceae	6	0.58	-0.030	2 & 4
5	<i>Chrysophyllum albidum (EF)</i>	Sapotaceae	2	0.19	-0.012	3 & 4
6	<i>Cordia millenii (EF)</i>	Boraginaceae	35	3.39	-0.115	All sites
7	<i>Dacryodes edulis (EF)</i>	Burseraceae	1	0.10	-0.007	2
8	<i>Denettia tripetala (EF)</i>	Annonaceae	4	0.39	-0.022	1 & 3
9	<i>Garcinia kola (EF)</i>	Guttiferaceae	3	0.29	-0.017	1
10	<i>Irvingia gabonensis (EF)</i>	Irvingiaceae	2	0.19	-0.012	2 & 3

**Table 3** cont

S/N	Tree species	Family	Abundance/ ha	RD	$piLnpi$	Sites found
11	<i>Lecaniodiscus cupanioides</i> EF	Sapindaceae	1	0.10	-0.007	3
12	<i>Myrianthus arboreus</i> (EF)	Moraceae	11	1.07	-0.048	All sites
13	<i>Pentaclethra macrophylla</i> (EF)	Palpilionaceae	2	0.19	-0.012	3
14	<i>Pterocarpus santalinoides</i> (VEG)	Papilionoidae	5	0.48	-0.026	1 & 4
15	<i>Pterygota macrocarpa</i> (VEG)	Sterculiaceae	6	0.58	-0.030	2, 3 & 4
16	<i>Spondias mombin</i> (EF/VEG)	Anacardaceae	2	0.19	-0.012	3
17	<i>Treculia africana</i> (EF)	Moraceae	5	0.48	-0.026	2 & 3
19	<i>Vitex doniana</i> (EF)	Verbenaceae	1	0.10	-0.007	3
20	<i>Xylopia aethiopica</i> (SP)	Annonaceae	2	0.19	-0.012	2 & 3
		Total	966		-3.778	

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 $H' =$ 

*Note: EF = Edible fruits, VEG = Edible vegetables, 1 = Shasha FR, 2 = Ala FR, 3 = Omo F R and 4 = Akure FR*

3.778

Results Cont.

**Table 4: List of four other lesser utilized plant species (shrubs, herb and lianas) in the ecosystem**

<b>Species</b>	<b>Family</b>	<b>Type</b>	<b>Abundance per ha</b>	<b>uses</b>
<i>Carpolobia lutea</i>	Polygaceae	Shrub	23	Fruit (licked when ripe)
<i>Tetracapidium conophorum</i>	Euphorbiaceae	lianas	5	Boiled or roasted and chewed
<i>Piper guinensis</i>	Piperaceae	herb	42	Spice and Soup condiment
<i>Afromomum melegueta</i>	Piperaceae	herb	13	Spice and Soup condiment

**Table 5: Nutritional properties of some selected fruits species in tropical rainforest ecosystem of southwest Nigeria**

Plant species	Proximate					Minerals						Anti-nutrition	
	Protein	Fat	Ash	Fibre	NFE	Ca	K	Na	P	Fe	Zn	Tannin	Phytate
<i>C. lutea</i>	121.84	95.03	21.61	282.74	478.78	0.87	7.75	0.10	6.38	1.01	0.69	13.02	0.17
<i>C. albidum</i>	56.84	63.1	6.58	340.05	533.27	1.18	11.28	0.98	1.00	0.75	0.14	12.12	0.24
<i>A. altilis (boiled)</i>	206.40	121.35	36.08	544.25	231.92	1.77	8.78	0.93	5.36	0.71	0.30	4.15	0.56
<i>A. altilis (roasted)</i>	156.27	130.91	34.17	555.30	123.35	1.53	10.89	0.63	5.14	0.82	0.78	8.28	0.65
<i>A. macrophylla</i>	304.11	201.59	47.87	36.9	409.53	1.70	3.73	0.88	3.22	0.07	0.28	6.41	0.79
<i>T. conophorum (boiled)</i>	262.47	374.88	79.91	35.53	247.21	1.56	6.88	0.52	4.16	0.04	0.07	10.22	1.57
<i>T. conophorum (roasted)</i>	284.53	343.92	67.70	25.38	278.47	1.72	4.29	0.84	2.87	0.59	0.06	8.15	1.74
<i>P. guinensis</i>	325.95	62.31	79.71	75.48	429.55	0.72	11.73	1.25	5.81	1.44	0.72	2.91	2.91
<i>T. tetraptera</i>	273.67	93.31	58.27	80.08	578.67	1.01	3.22	1.00	2.11	0.70	0.08	8.27	3.27
<i>V. paradoxa</i>	308.31	140.40	71.26	57.52	422.50	1.46	5.10	0.42	2.00	0.89	0.06	1.78	1.78

*Source: Adekunle and Oyerinde (2004)*

## SALIENT FINDINGS

- Out 108 tree species in this ecosystem, 20 (19%) are producing edible fruits, vegetable or spices (table 2).
  - All of them are indigenous wild plants of narrow range.
  - The relative abundance of these useful food sources per hectare is very low (between 1 and 7)
  - but *Cola millenii* (Obi edun) has 35 and *Myriantus arboreus* (Ibisere) 11 stands per hectare.
  - Six (30%) of the food species occurred only once per hectare, 90% is less than 5 trees per hectare.
  - Consumption of some, such as *Irvingia gabonensis*, *Denettia tripetala*, *Garcinia kola*, *Treculia africana*, *vitex doniana*, *Dalium guinensis* and *Dacryodes edulis*, is now very popular both in rural and urban centers.
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## CONCLUSION

- ❑ Virtually all the plant species with food and ethno-medicinal potentials are threatened with extinction as a result of very low frequency of occurrence per hectare.
  - ❑ Those not present in a particular site must have gone into extinction in that site due to over exploitation and clearance of forest for other purposes.
  - ❑ All these valuable plants are very rich in food nutrients essential for growth and proper development.
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## CONCLUSION cont.

- They are available all year round.
  - Those available during the dry season are good for quenching thirst
  - They are available in the forest free of charge, as a result, sources of cheap protein and minerals to rural people and urban poor who cannot afford the cost of the exotic ones like orange.
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Recommendations:

- ❑ There is need for urgent conservation measures for sustainable use.

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- ❑ Insitu conservation is recommended for those that cannot thrive outside their natural habitat while exsitu conservation is good for preserving others.
- ❑ The tropical rainforest ecosystem should be properly protected from illegal loggers and encroachers.
- ❑ Total clearance of the forest for construction should be avoided.

□ *Recommendation cont*

- Most of these plant species are still in the wild at present, plantation establishment should be embarked upon by the government and incentives given to individuals willing to plant them.
  
- Appropriate technologies and biotechnology approach should be developed to reduce their gestation period.
  
- Good processing and packaging will make them desirable by all

Thanks for listening

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