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Indigenous Utilization of Forest Plant Leaves in Malaria Treatment in Ogun State, Nigeria

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Abstract

This study examined indigenous utilization of forest plant leaves in malaria treatment in Ogun State, Nigeria to provide further information on the indigenous knowledge of forest plants leaves in healthcare delivery systems. Multi-stage sampling technique was adopted in this study. A total of one hundred and seventy-four respondents were sampled according to population distribution in each area. Well-structured questionnaire were administered through interview schedules on some randomly selected household users. A total of 50 plants species from 31 families were identified. These consisted of trees (44%), shrubs (20%), herbs (22%) and climbers (14%) whose leaves were usually extracted to effect cure during malaria attacks were recorded. Domestication of some of the plant leaves is essential and therefore recommended in order to prevent the extinction of the plants as there are fast disappearance of the African flora especially Nigerians' due largely to deforestation of conservation of the forest plants.

Keywords: Forest Plants, Leaves-'Ewe', Malaria, Concoction, Decoction.

1. Introduction

Forest plant leaves are found within diverse ecological zones of Nigeria. Depending on the species involved, a particular product may be restricted to or span through more than one ecological zone. For instance, leafy vegetables are obtained from various species in the different ecological zones. Leaves are put into different uses, which include food, medicines, roofing, household utensils and cultural values [1-3], approximately estimate that eighty percent of the people in developing countries depend on forest plant through traditional medicine for primary health care needs and modern pharmacopoeia still contain at least 25% drugs derived from plants and many others which are synthetic analogues built on prototype compounds isolated from plant [4]. Unfortunately, however, indigenous people have been more than decimated. For instance, the Amerindian population of Brazil is only 0.1% of its 1492 A.D. level and current tribal extinction rates are more than one per year. This is an irreversible loss of cultural diversity and ultimately, loss of indigenous knowledge with a myriad of biological consequences. In addition, natural resources are vanishing before people become aware of their existence [5].

In Nigeria, Malaria is endemic throughout the country, World Health Organization (WHO) estimated malaria mortality rate for children under five in Nigeria at 729 per 100,000. The Ministry of Health reported in April 2004 that malaria is responsible for one out of ten deaths in pregnant women [6]. In Nigeria various plants are used for the managements of malaria and these vary from one locality to another [7, 8]. This study was aimed at documenting indigenous utilization of forest plant leaves in malaria treatment in Ogun State, Nigeria to provide further information on the indigenous knowledge of forest plants leaves in healthcare delivery systems. The results should provide information crucial to a review of forest policy and plant diversity conservation in Ogun State, and Nigeria as a whole.

2. Methodology

2.1 The Study Area

Ogun State, created in February, 1976 from the Old Western State of Nigeria, is one of the 36 states in Nigeria. It covers an area of 16,762km²[9]. This includes a total area of 2,371.48km² of forest reserve [10]. The state lies between latitudes 6° and 8°N and longitude 2°31' and 5°E. It is situated in the moist tropical rain forest zone, much of which has been deforested. The State usually experience two seasons, the rainy season between March and November, and the dry season, November to March. Ogun State with a population of 3,728,098 million people [11] has 20 local government areas. The study area (Ogun State) was divided into three areas: Egba, Yewa and Ijebu/Remo as sub-ethnic divisions. The areas were based on ecological and climatic

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factors having political characteristics that fall along sub-ethnic divisions in the state. Egba and Yewa areas have forest and derived savanna vegetation types while Ijebu/Remo is in the rainforest region.

2.2 Sampling Techniques

Multistage sampling procedure was adopted in selecting the sample population from which data were collected for this study. The State was first divided into three areas representing the first stage of sampling which produced a sample of primary selection unit. Each primary selection unit denotes a stratum. In the second stage of sampling, from each of these areas, three (3) local government areas were selected based on pre-tested survey information. In the third stage, the number of respondents was determined with Probability Proportional to Size (PPS) based on population distribution in the strata. One hundred and seventy-four (174) respondents of forest plant leaves household user and traditional herbalist were also randomly selected based on PPS determined number. Ogun State with a population of 3,728,098 million people^[11] has 20 local government areas. The study covers 9 local government areas (that is 45 percent) from where respondents were selected. The populations of the strata were as follows: Egba–1,369,900, Ijebu–1,248,314 and Yewa–1,109,884, with a pre-determined sample size of 174 respondents, the sampling pattern was as follows:

Egba–64 Respondents (3 local government areas)
Ijebu–58 Respondents (3 local government areas)
Yewa–52 Respondents (3 local government areas)

3. Results and Discussion

The summary of the plant species, their uses and methods of use are presented in the tables 1. The result showed that fifty (50) of forest plants species were utilized by the respondents for malarial treatment. The fifty (50) forest plants species belongs to 31 families. This is an update of^[12] study that reported 109 forest plants leaves species belonged to 49 families out of which twenty-one (21) species were used in treating malaria^[8], reported thirty-six forest plants leaves were used in the treatment of malarial in Oke-Igbo area of Ondo State, out of fifty plants reported in the study^[13]; study also reported 20 species belonging to 16 families^[14]. Reported twenty-two plants that were used in Malaria treatment in southwestern state of Nigeria^[15]; reported that fourth-three plants species were used in the treatment of Malaria in Ekiti State, Nigeria out of which over sixty-five percent were forest plants leaves. Of these 31 families, 67.74% were each represented by one species while 16.13% were represented by two species. Represented by three and four species were 9.68% and 3.22% respectively while five species were also represented by 3.22%. The trend was that a broad diversity of families and species were used by the people. The identified families are: *Anacardiaceae*, *Apocynaceae*, *Asteraceae*, *Asclepiadaceae*, *Bignoniaceae*, *Capparaceae*, *Caricaceae*, *Celastraceae*, *Chenopoidaceae*, *Combretaceae*, *Crassulaceae*, *Cucurbitaceae*, *Euphorbiaceae*, *Hippcrateaceae*, *Icacinaceae*,

Lytheraceae, *Labiaceae*, *Leguminosae*: *papilionoidae* (*Fabiaceae*), *Malvaceae*, *Meliaceae*, *Moraceae*, *Myrtaceae*, *Pandaceae*, *Poaceae*, *Piperaceae*, *Portulacaceae*, *Rutaceae*, *Rubiaceae*, *Sapindaceae*, *Verbanaceae*, and *Zingiberaceae*. From the array of medicinal plants used for malaria therapy in south western state of Nigeria, this study is an updates of uses of forest plants leaves in Ogun state, it has shown that indigenous medicinal plants exist, and it can be exploited in the development of new antimalarial drugs (Table 1). The plants habits, form used either fresh or dry, period of harvest either dry season or rain season, availability either rare, common or already in extinction, sources either from the cultivated one or wild or purchased, preservation method either sun dry, air dry or chemical were used, shelf life and frequency of mentioning the plants either high or low were all described in the tables one. These plants are similar to those used for malaria therapy in Ghana^[16], Sierra Leone^[17] and agree with the work of Oliver^[18, 19] on medicinal plants of Nigeria, as also reported by^[8]. Plant type categorizations of the species were shown in Figure (1). Trees have 44% species followed by Herbs with 22% species, Shrubs 20% species and Climbers with 14% of species. The leaves of these plants were used singly or in combination with other herbal materials in the fresh or dried forms. The mode of application is mostly oral by drinking the extracts as decoction (44% of the plants species) or concoctions. Some management implications can be deducted from this study, for instance deforestation has been a bane to sustainable utilization of forest resources especially in the tropical countries like Nigeria. For instance majority of the plants are from the wild, if the area is cleared for other purposes, these plants might not be available for use again. Also constant plant defoliation might make regeneration almost near impossible and this is not compatible with the principles of environmental sustainability while in the early twentieth century, reforestation was among the weapons used in the battle to eliminate malaria from Italy^[20]. The majority of the uses were medicinal was not surprising because in man's quest for subsistence, some of his foremost priorities have been food and good health. The results reflect that the use are broadly known by the respondents though knowledge and the uses are diverse and varies between individual, families and communities. There are, however, key individuals who are custodians of very "sensitive" knowledge. These persons are those who invariably act as "healers" or "consultants" in their communities.

4. Conclusion

The concern for deforestation and desertification has made timber, fuel wood and charcoal popular in forest resources management. However, this study has revealed that forest plant leaves are equally important especially in the area of health care delivery system of rural and urban dwellers. Forest plant leaves are utilized mainly for various medicinal purposes. Therefore, the political changes in Nigeria due to democratization should enhance the formulation of new forest policies which would be holistic enough to cater for the sustainable utilization of forest plant leaves in Nigeria.

Table 1: Different Types of Forest Plant Leaves Utilized As Anti-Malaria Treatment in the Study Area

S/N	LN	SN	FMY	PF	FU	Method of Use	HBT	PH		Avbty			Srce			Psvtn			Freq	SL	
								Scarce	Abnt	Rare	Cmn	Ext	Wild	Cvtv	Psd	sun	AD	Chem			
1.	ÈwéMesén-mesén / Ojúólogbò	<i>Abrusprecatorius</i> Linn.	Leguminosae: Papiloinoideae	Climber	F	Prepared as concoction and decoction is taken	DL	D	R	N	Y	N	N	Y	Y	Y	Y	Y	N	H	3-6mth
2.	EwéKajú	<i>Anacardiumoccidentale</i> Linn.	Anacardiaceae	Tree	F	Prepared as decoction	DL	A	R	N	Y	N	N	Y	Y	Y	Y	Y	N	H	1yr
3	EwéAgbárfetu	<i>Alafia barteri</i> Oliv.	Apocynaceae	Herb	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	N	H	1yr
4.	EwéAhun	<i>Alstoniaboonei</i> De Wild.	Apocynaceae	Tree	F/D	Prepared as decoction	DL	A	R	N	Y	N	Y	N	Y	Y	Y	N	N	H	6mth
5.	Ewéìpà / òmísín	<i>Alchorneacordifolia</i> (Schum. &Thonn.) Müll. Arg.	Eupobiaceae	Shrub / Tree	F/D	Prepared as decoction	B	D	R	N	Y	N	N	Y	Y	Y	Y	Y	N	H	3-6mth
6.	EwéAtare	<i>Aframomummeleguet</i> a K. Schum.	Zingiberaceae	Herb	F	Prepared as decoction	WL	D	R	N	Y	N	N	Y	Y	Y	Y	N	N	H	6mth
7.	EwéDógónyárò	<i>Azadirachtaindica</i> A. Juss.	Meliaceae	Tree	F	Prepared as decoction	DL	A	R	N	Y	N	N	Y	Y	Y	Y	Y	N	H	1yr
8.	EwéOparun	<i>Bambusavulgaris</i> Schrad.	Poaceae	Tree	D	Prepared as decoction	WL	A	R	N	Y	N	Y	Y	Y	Y	Y	Y	N	H	1yr
9.	EwéIsinOko	<i>Blighiaunijugata</i> Bak.	Sapindaceae	Tree	F	Prepared as decoction	DL	A	R	N	Y	N	N	Y	Y	Y	Y	N	N	H	6mth
10.	EwéÌbépe	<i>Caricapapaya</i> Linn.	Caricaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	N	H	3mth

Source: Field Survey

A: A: All season

Abnt: Abundant

DL: Dry land

AD: Air Dry

Av: Average

Avbty: Availability

B: B: Both Dry Land and Wet Land

Chem: Chemical

Cmn: Common

Cvtv: Cultivated

D: Dry Season

Ext: Extinct

F: F: Fresh

F/D: Fresh & Dry

FMY: Family

FU: Form use

H: High

HBT: Habitat

L: Low

L L/N: Local Name

MWL: Mostly WetLand

N: No

PF: Plant Form

PH: Period of Harvest

Psd: Purchased

Psvtn: Preservation

sR: Rainy season

SL: Shelf Life

Srce: Source

SN: Scientific Name

Y: Yes

WL: Wet land

Continued: Different Types of Forest Plant Leaves Utilized As Anti-Malaria Treatment in the Study Area

S/N	LN	SN	FMY	PF	FU	Method of Use	HBT	PH		Avbty			Srce			Psvtn		Freq	SL	
								Scarce	Abnt	Rare	Cmn	Ext	Wild	Ctvt	Psd	sun	AD			Chem
11.	EwéOsànwéwé	<i>Citrus aurantifolia</i> (Christm.) Swingle	Rutaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	Y	Y	Y	Y	N	N	H	1yr
12.	EwéÀjéòbàlé	<i>Croton zambesicus</i> Muell. Arg.	Euphorbiaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	N	N	H	1yr
13.	EwéÀpàkó	<i>Cleistopholis patens</i> (Benth.) Engl. & Diels	Annonaceae	Tree	F	Prepared as decoction	WL	R	D	N	Y	N	Y	Y	Y	Y	N	N	H	6mth
14.	EwéÈpìà	<i>Cleome viscosa</i> Linn	Capparaceae	Herb	F	Prepared as concoction or mixed with soap for treating headache	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	3mth
15.	EwéÒdúndún	<i>Emilia coccinea</i> (Sims) G. Don	Asteraceae	Herb	F/D	Prepared as Concoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	3mth

Source: Field Survey.

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								Scarce	Abnt	Rare	Cmn	Ext	Wild	Cvt	Psd	sun	AD	Chem		
16.	EwéEépin	<i>Ficusexasperata</i> Vahl	Moraceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	6mth
17.	EwéMáwolúlè	<i>Reissantia indica</i> (Willd.) Hallé	Hippcrataceae	Climber	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	2mth
18.	EwéLàáli	<i>Lawsoniainermis</i> Linn	Lytheraceae	Shrub	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	3mth
19.	EwéEfinrin (Fòrómábà)	<i>Lippiamultiflora</i> Mold enke	Verbenaceae	Shrub		Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	L	1mth
20.	EwéYánrin	<i>Launaeataraxacifolia</i> (Willd.) Amin. MS ex C. Jeffrey	Asteraceae	Herb	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	3wk
21.	Ewé Mángòrò	<i>Mangifera indica</i> Linn.	Anacardiaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1mth

Source: Field Survey.

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B: B: Both Dry Land and WetLand	Chem: Chemical	Cmn: Common	Cvt: Cultivated	D: Dry Season	Ext: Extinct
F: F: Fresh	F/D: Fresh & Dry	FMY: Family	FU: Form use	H: High	HBT: Habitat
L L/N: Local Name	MWL: Mostly WetLand	N: No	PF: Plant Form	PH: Period of Harvest	Psd: Purchased
Psvtn: Preservation	R: Rainy season	SL: Shelf Life	Srce: Source	SN: Scientific Name	Y: Yes
					WL: Wet land

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S/N	LN	SN	FMY	PF	FU	Method of Use	HBT	PH		Avbty			Srce			Psvtn		Freq	SL	
								Scarce	Abnt	Rare	Cmn	Ext	Wild	Ctyt	Psd	sun	AD			Chem
22.	EwéEjìnrìn	<i>Momordicacharantia</i> Linn.	Cucurbitaceae	Climber	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1mth
23.	EwéItó	<i>Millettiathonningii</i> (S chum. &Thonn.) Bak.	Leguminosae: Papilionoideae	Tree	F	Prepared as decoction	WL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	6mth
24.	EwéWèrèpè	<i>Mucunapruriens</i> (Lin n.) DC. var. <i>puriens</i>	Leguminosae: Papilionoideae	Climber	F	Prepared as decoction and	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1mth
25.	EwéAkòko	<i>Newbouldialaavis</i> (P. Beauv.) Seemann ex Bureau	Bignoniaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1yr
26.	EwéEfinrinosó	<i>Occimumgratissimum</i> Linn.	Labitaceae	Shrub	F	Prepared as decoction also squeezed with salt to drink the extract.	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1wk
27.	EwéÈyìnOlóbe	<i>Phyllanthusamarus</i> Sc hum. &Thonn.	Euphorbiaceae	Herb	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1mth

Source: Field Survey.

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								Scarce	Abnt	Rare	Cmn	Ext	Wild	Ctvt	Psd	sun	AD			Chem
28.	EwéEmígbégi	<i>Pseudocedrelakotschyii</i> (Schweinf.) Harms	Meliaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1yr
29.	EwéEfòn	<i>Piper umbellatum</i> Linn.	Piperaceae	Climber	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1wk
30.	EwéPónjúÒwìwí	<i>Reissantiaindica</i> (Willd.) N.Hallé	Celastraceae	Shrub	F/D	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	2mth
31.	EwéÈkìkàiyeyè	<i>Spondiasmombin</i> Linn	Anacardiaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	3mth
32.	EwéIfín	<i>Sida rhombifolia</i> Linn.	Malvaceae	Perennial Herb	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1yr
33.	EwéÍdí / Orín Pupa	<i>Terminaliaschimperiana</i> Hochst.	Combretaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	2wk
34.	EwéAkó-rere	<i>Trichilimonadelph</i> (Thonn.) J.J. De Wilde	Meliaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	Y	Y	Y	Y	Y	N	H	1yr
35.	EwéEwúro	<i>Vernoniaamygdalina</i> Del.	Asteraceae	Shrub / Tree	F	Prepared as concoction, decoction also squeezed to drink the extract.	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1yr

Source: Field Survey.

A: A: All season Abnt: Abundant DL: Dry land AD: Air Dry Av: Average Avbty: Availability
 B: B: Both Dry Land and WetLand Chem: Chemical Cmn: Common Ctvt: Cultivated D: Dry Season Ext: Extinct
 F: F: Fresh F/D: Fresh & Dry FMY: Family FU: Form use H: High HBT: Habitat L: Low
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								Scarce	Abnt	Rare	Cmn	Ext	Wild	Cvtv	Psd	sun	AD			Chem
36.	EwéIná	<i>Cucumis melo</i> Linn.	Cucurbitaceae	Herb	F	Mixed with soap for bathing	WL	D	R	N	Y	N	Y	Y	Y	Y	N	N	H	1yr
37.	EwéItéjú	<i>Gongronemalatifoliu</i> mBenth.	Asclepiadaceae	Climber	F/D	Prepared as decoction	DL	D	R	N	Y	N	Y	N	Y	Y	Y	N	H	1yr
38.	EwéÓrúwo	<i>Morindalucida</i> Benth.	Rubiaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1yr
39.	EwéÌrùÒkété	<i>Pyrenacanthastaudtii</i> (Engl.) Engl.	Icacinaceae	Shrub/Small Tree	F	Prepared as decoction	WL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1mth
40.	EwéGílófà	<i>Psidiumguajava</i> Linn.	Myrtaceae	Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	6mth
41.	EwéÈgbèsi	<i>Sarcocephaluslatifoli</i> us(Sm.)E.A Bruce	Rubiaceae	Shrub/Tree	F/D	Prepared as decoction	WL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1mth

Source: Field Survey.

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								Scarce	Abnt	Rare	Cmn	Ext	Wild	Cvtv	Psd	sun	AD			Chem
42.	EwéÀbámódá	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Crassulaceae	Herb	F	Prepared as Concoction	DL	D	R	N	Y	N	N	Y	Y	Y	N	N	H	Nil
43.	Ewé Àrùnpálé	<i>Chenopodium ambrosioides</i> Linn.	Chenopodiaceae	Herb	F	Prepared as Concoction	DL	A		N	Y	N	Y	N	Y	Y	N	N	H	1mth
44.	EwéÒsúnún	<i>Microdesmis puberula</i> Hook. f. ex Planch	Pandaceae	Shrub/Tree	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	2mth
45.	EwéInà	<i>Mucuna loanei</i> Fawcett & Rendle	Leguminosae: Papilionoideae	Climber	F	Prepared as concoction and also in powdery form, mix with cream or soap.	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1yr
46.	EwéTábà	<i>Nicotiana tabacum</i> Lin.	Solonaceae	Herb	F	Prepared as decoction	DL	D	R	N	Y	N	N	Y	Y	Y	Y	N	H	1yr

Source: Field Survey.

A: A: All season	Abnt: Abundant	DL: Dry land	AD: Air Dry	Av: Average	Avbty: Availability
B: B: Both Dry Land and WetLand	F/D: Fresh & Dry	Chem: Chemical	Cmn: Common	Cvtv: Cultivated	D: Dry Season
F: F: Fresh	FMY: Family	FU: Form use	H: High	HBT: Habitat	Ext: Extinct
L L/N: Local Name	MWL: Mostly WetLand	N: No	PF: Plant Form	PH: Period of Harvest	L: Low
Psvtn: Preservation	R: Rainy season	SL: Shelf Life	Srce: Source	SN: Scientific Name	Psd: Purchased
				Y: Yes	WL: Wet land

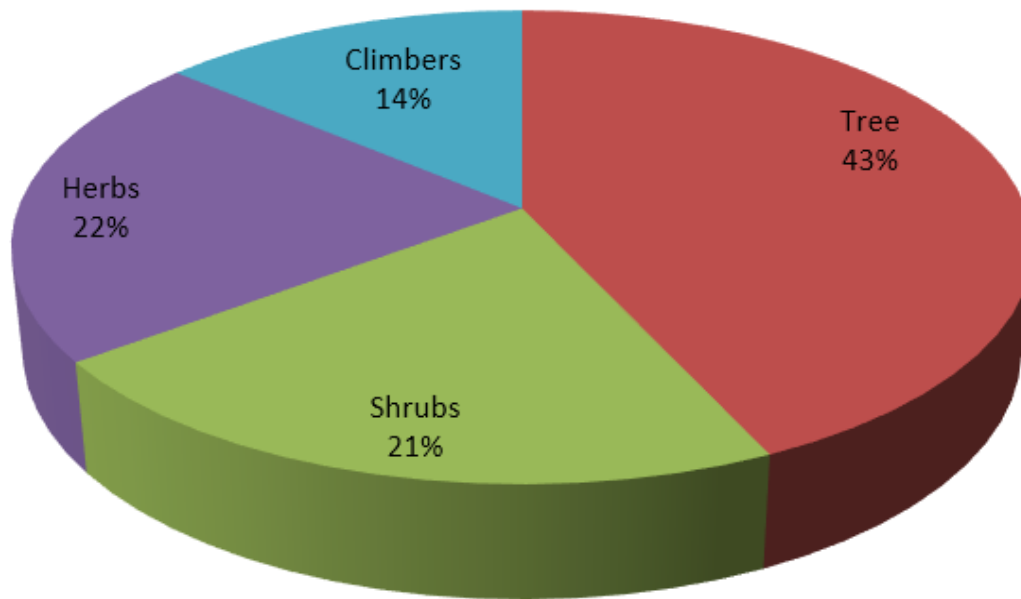


Fig 1: Forest Plants Leaves Type Categorization in the Study Area

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