

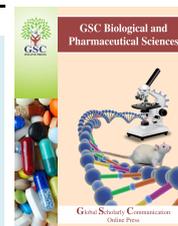


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(RESEARCH ARTICLE)



## Ethnomedical study of plants used by indigenous people of Nyiev and Mbawa Districts, Makurdi, Benue State, Nigeria

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### Abstract

An ethnomedical survey was carried out to document medicinal plants used in the treatment of ailments by indigenous people in Nyiev and Mbawa Districts, University of Agriculture Makurdi, Nigeria. Copies of 64 semi-structured questionnaires were used for collecting information from the rural dwellers and traditional medical practitioners selected from the various villages in the study area. Plants and the parts commonly used, method of preparation, dosage use and disease treated, were noted and recorded. A total of 59 medicinal plant species belonging to 41 families were found to be used in treating 56 different types of diseases in the study area. The family of Meliaceae had the highest (13%) proportion of medicinal plants used, followed by Fabaceae (11%), Lamiaceae (9%), Asteraceae (8%) Annonaceae (7%) and the remaining 36 families had (52%). About 80% of all the medicinal plants recorded were collected from the wild, while only 20% were collected from home gardens. The parts of the plants that is predominantly used were leaves (44%), roots (34%), branches (7%), bark and fruits (6%) and flower, tuber and whole stem (1%) respectively. Most of the plant species were used to treat one form of disease, while some were used to treat more than one type of diseases. The plant species used for the treatment of many diseases was *Ocimum gratissimum* which was reportedly used in treating 8% of the diseases. The study area was observed to have to different plant species that the indigenous people depended on for their health care.

**Keywords:** Ethnomedicine; Indigenous; Medicinal plants; Disease; Treatment

### 1. Introduction

John Harshburger (1896) is regarded as the first American botanist to use the term ethnobotany. Since then, it has been considered to be the study of the ways in which communities of a particular geographical location make use of the indigenous plants for food, clothing and medicine [1]. Most studies in ethnobotany is majorly concerned with the documentation of local names of plants and how local people utilize them [2-4].

Ethno-botanical research is a way of cultural rescue [5]. It helps in recording and documenting how local people use plants. Some of these plants are already in extinction; documenting information about them will make information about their usage available and encourage research in the field of botany. This also will contribute in no small measure in strengthening indigenous culture and can demonstrate the value of cultural diversity. [6].

A medicinal plant is any plant that in one or more of its parts contains chemicals that can be used for therapeutic purposes or chemicals that can be used for drug production [7]. All over the world, medicinal plants have been extensively used as a major source of drugs for treatments of a number of health disorders. Some ailments that have defied the modern medical practice are often treated with traditional approach [8]. In most parts of the world where

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healthcare centres are not available or if available they may not be affordable, the populace continue to utilize traditional medicine to treat ailment as they are cheap and affordable [9]. These plants serve as important components of human health care particularly for rural communities who solely depend on forest plants for food, shelter, energy and medicines [10]. About 80% of the rural populations in the world use plants for the treatment of ailment. This is because the herbs are potent and in many cases pharmaceutical drugs are either expensive or difficult to get. [11].

It has been reported that a good number of drugs are developed from plants that are proven to be potent against some form of diseases. [12]. This predominantly involves extraction, isolation and purification of active ingredient found in the plant or its part and subsequent modification [12]. In the developed countries, 25% of the medical drugs are based on plants and their derivatives. And the use of medicinal plants is well known among the indigenous people in rural areas of many developing countries. The potent nature of medicinal plants and their contribution to the health of a significant number of people all over the world has attracted research interest from various disciplines that were not originally into phytomedicine. [13]. The aim of this study therefore was to carry out the ethnomedical survey of plants used by indigenous people of Nyiev and Mbawa Districts, Makurdi in order to document findings and encourage conservation of utilized plants in the study area.

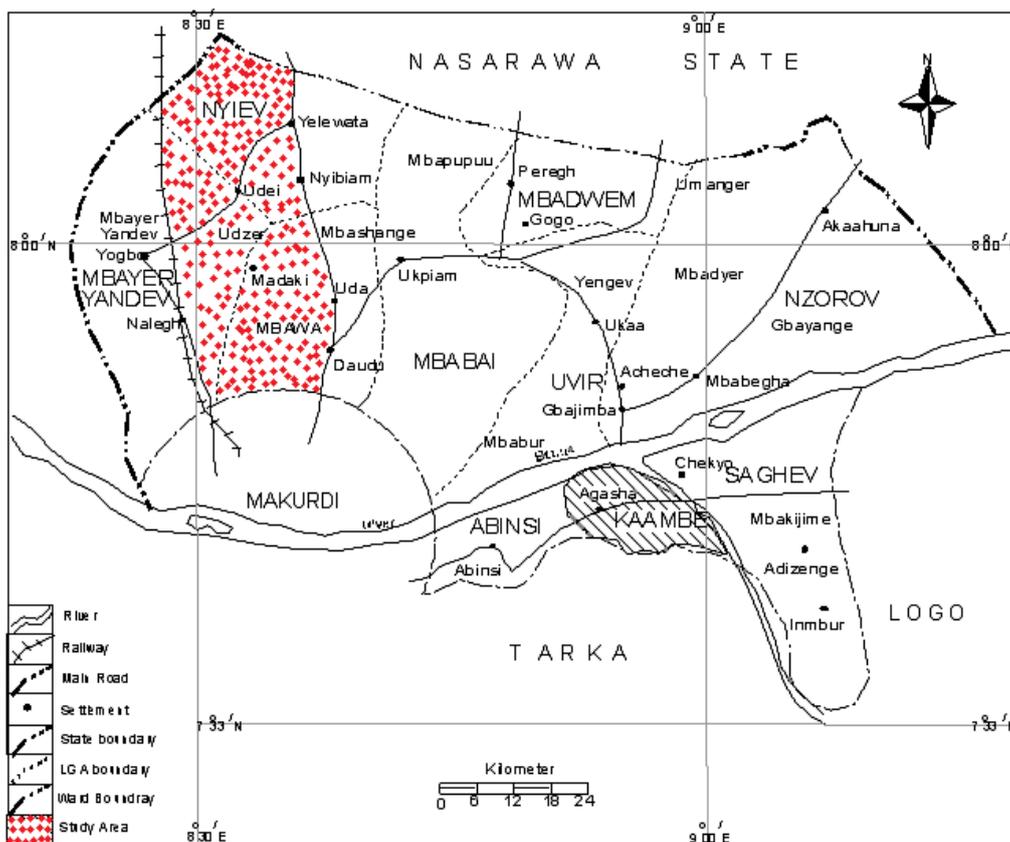
## 2. Material and methods

### 2.1. Study area

The research was carried out in villages around the University of Agriculture in Makurdi. Makurdi (Fig. 1) is the capital of Benue State, Nigeria. The town is very warm with an average maximum and minimum temperature of 35 °C and 21 °C respectively and an annual rainfall that ranges between 508 mm and 1041mm. The university occupies an arable land area of 8045 hectares, thus making it the largest holder of agricultural land mass amongst institutes of its kind. It lies within the Southern guinea savanna zone between latitude 7° 45' N and 7° 52' N and longitude 8° 35' E and 8° 4' E [14].



**Figure 1** Map of Benue State showing Makurdi Local Government Area (Source: [15])



**Figure 2** Map of Makurdi Local Government Area Showing Nyiev and Mbawa Districts (Source: [16]).

## 2.2. Sampling

Stratified simple random sampling technique was adopted for the study. The University of Agriculture Makurdi communities are made up of 2 Districts: Nyiev and Mbawa (Fig. 2). In each District, 4 kindred were randomly selected giving a total of 8 kindred. In each of the selected kindred, 8 users of medicinal plants were selected for interview based on information of herbal practices in the area. Therefore, the sample size for the study was 64 respondents.

## 2.3. Data Collection

Ethnobotanical data were collected for a period of three weeks using the method of Matin [17]. Data were collected by the use of semi-structured questionnaires direct interview with selected indigenous people of every kindred selected, and field observation. The data collected for the study include socio-demographic attributes of the respondents, type of plants used for the treatment of various ailments in the area, duration of treatment. For each species mentioned, the main habitat, growth habit, method of preparation of medicinal plants medicine and administration in the locality was recorded.

## 2.4. Data Analysis

Data collected were analyzed with the use of simple descriptive statistics.

## 3. Results

The demographic variables of the respondents in the study area are shown in the table 1. Sixty four (64) medicinal plant users were interviewed, within the age range of 25 to 74 years, and 44% of them being older than 45 years. Out of the 64 informants interviewed, 58 (90.63%) of them were male and only 6 (9.38%) were female. The results shows the marital status, education status and occupation of medicinal plant users, 34.38% were single, 56.25% Married, 4.69% Widower, while 81.25% no formal education, 12.50% primary education, 6.25% secondary education. In the aspect of occupation, 89.06% Farmers, 10.94%, Civil servant, trading and Hunting were 0%.

**Table 1** Socio-Demographic attributes of medicinal plant users

Variables (V)	Category	Frequency	Percentage (%)
Sex	Male	58	90.63
	Female	6	9.38
	Single	22	34.38
Marital Status	Married	36	56.25
	Widow	3	4.69
	Widower	3	6.49
	Informal education	52	81.25
Education	Primary	8	12.50
	Secondary	4	6.25
	Occupation	Farming	57
Occupation	Civil Servant	7	10.94
	Trading	0	0
	Hunter	0	0

**Table 2** Recipes, preparation, mode of administration and dosage of the medicinal plants to different ailments in the study area

S/No.	Recipes (Scientific Name)	Local Name in Tiv	Part Used	Mode of Preparation	Mode of Administration	Ailments
1	<i>Carica papaya</i>	Mbuer	R	Swd	100mls, 3/day for 7 days.	Stomach pains
	<i>Sarcocephalus latifolius</i>	Ikurakase	R	BWD	1 cup daily for 3 days.	
	<i>Ficus thonningii</i>	Akinde	L	Grinded & taken orally.	2 to 3 days.	
	<i>Ocimum gratissimum</i>	Kungureku utamen	L	BWD	3 to 6 days	
	<i>Khaya senegalensis</i>	Haa ukiriki				
	<i>Ddeterium microcarpum</i>	Lien				
2	<i>Erythrina senegalensis</i>	Shough	B	BWD	One cup for 7 days.	Stomach cementing and urinating blood.
	<i>Ficus Thonningii</i>	Akinde	B			
	<i>Ocimum Gratissimum</i>	Kungureku Utamen	L			
3	<i>Maytenus senegalensis</i>	Alom	R	BWD	1 cup daily for 7 days.	Hernia
	<i>Annona senegalensis</i>	Hur	R			
	<i>Eclipta alba</i>	Usu	R			
	<i>Maytenus senegalensis</i>	Alom	R			
	<i>Gardenia erubescens</i>	Ishondou	R			
4	<i>Ocimum Gratissimum</i>	Kungureku Utamen	L	BWD	7 to 14 days.	Fracture/Dislocation
	<i>Pistia stratiotes</i>	Ichigh ki	L			
	<i>Smilax anceps</i>	Uwer	L			
	<i>Khaya senegalensis</i>	Haa ukiriki	BK	Ground and applied to the affected part.	Until you totally healed.	
	<i>Senna occidentalis</i>	Tsetsa/tsitsa	L			
	<i>Vitellaria paradoxa</i>	Chamegh	Oil	BWP	7 days	
	<i>Khaya senegalensis</i>	Haa ukiriki	BK			
	<i>Capsicum annum</i>	Mkem	F			

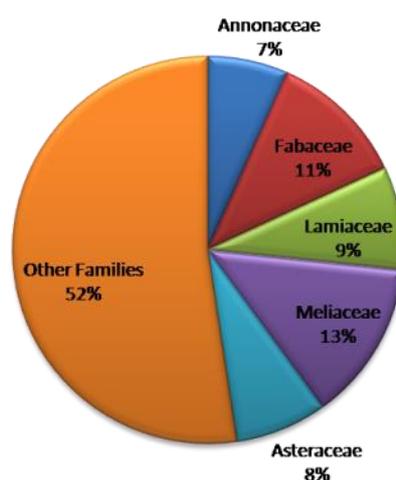
	<i>Erythropleum suaveolens</i>	Kor	BK			
5	<i>Daniella oliveri</i>	Chiha	Flower	PS	Very small for a day.	Purging
	<i>Bridelia ferruginea</i>	Ikpine	Leaves			
	<i>Aspilia africana</i>	Oso-oso	R	Grinded and taken orally.	7 days	
	<i>Annona senegalensis</i>	Hur				
	<i>Psidium guajava</i>	Gova	L	BWD	1 cup daily 2 to 3 days.	
6	<i>Prosopis africana</i>	Gbaaye	R	BWD	1 cup daily for 7 to 14 days.	General body pains
	<i>Smilax anceps</i>	Uwer	L			
	<i>Ocimum Gratissimum</i>	Kungureku Utamen	L			
7	<i>Azadirachta indica</i>	Dogonyaro	B	BW Inhale	30 mins.	Catarrh
	<i>Ceratotheca sesamoides</i>	Karkeshi				
	<i>Ocimum Gratissimum</i>	Kungureku Utamen	L			
	<i>Khaya senegalensis</i>	Haa ukiriki				
	<i>Ddeterium microcarpum</i>	Lien				
8	<i>Trema orientalis</i>	Chiese	L	BWD/Bathing	6 days	Measles
9	<i>Mangifera indica</i>	Murgur		BWD	100mls 3 times daily for 7 days	Malaria
	<i>Musa sapientum</i>	Ayaba				
10	<i>Annona senegalensis</i>	Hur	B	SWD	1 cup daily for 7 days	Coughing
11	<i>Khaya senegalensis</i>	Haa ukiriki	L	Grinded and apply to the affected part.	3 days	Guinea worm
12	<i>Citrus aurantium</i>	Alumu angen	FL	BWD	1 cup daily for 7 days.	Typhoid fever
	<i>Psidium guajava</i>	Gova	L			
	<i>Mangifera indica</i>	Murgur				
	<i>Ficus thonningii</i>	Akinde				
	<i>Erythrina senegalensis</i>	Shough				
	<i>Azadirachta indica</i>	Dogoyaro				
13	<i>Ficus thonningii</i>	Akinde	L	Grinded and taken orally	7 days	Frequent hunger/purging
14	<i>Gardenia erubescens</i>	Shondou	R	Grinded and taken orally.	7 days	Appendix
	<i>Aspilia africana</i>	Oso-oso				
	<i>Gardenia erubescens</i>	Ishondou		BWD	7 days	
	<i>Strychnos spinosa</i>	Amako				
	<i>Maytenus senegalensis</i>	Alom				
	<i>Uvaria chamae</i>	Ikyo				
15	<i>Ocimum gratissimum</i>	Kungureku utamen	L	SWD and chaff applied in the area.	300mls daily for 2-3 days	Itching of womanhood and laps
	<i>Terminalia avicemiodes</i>	Kuegh				
16	<i>Ocimum gratissimum</i>	Kungureku utamen	L	Grinded and applied to the affected part.	7 to 14 days	Swollen parts
	<i>Lagenaria siceraria</i>	Jondo				

	<i>Senna occidentalis</i>	Tsitsa				
	<i>Ageratum conyzoides</i>	Ngokwase				
17	<i>Uvaria chamae</i>	Ikyo	R	BWD	100mls 3 times daily for 7 days	Bleeding /vomiting blood
	<i>Bridelia ferruginea</i>	Ikpine				
	<i>Maytenus senegalensis</i>	Alom				
	<i>Pterocarpus erinaceus</i>	Ngaji				
	<i>Gardenia erubescens</i>	Ishondou				
	<i>Piilostigma thonningii</i>	Nyihar	L			
	<i>Stereospermum kunthianum</i>	Uman atumba	BR			
18	<i>Mangifera indica</i>	Murgur	BK	BWD BWD	1 cup daily for 6 days.	Dizziness
	<i>Carica papaya</i>	Mbuer	F		1 cup daily 7 to 14 days.	
	<i>Mangifera indica</i>	Murgur	BK			
19	<i>Cochlospermum planchoni</i>	Kpavande	L	BWD	1 cup daily for 6 days.	Stomach ulcer
	<i>Annona senegalensis</i>	Hur				
	<i>Piliostigma thonningii</i>	Nyihar				
	<i>Bridelia ferruginea</i>	Ikpine				
	<i>Annona senegalensis</i>	Hur				
	<i>Combretum molle</i>	Azulugh				
	<i>Lawsonia inermis</i>	Lale				
	<i>Canthium spp.</i>	Ligom				
	<i>Bridelia ferruginea</i>	Ikpine				
	<i>Carica papaya</i>	Ayaba				
	<i>Erythrina senegalensis</i>	Shough	F	BWD	1 cup daily for 7 days	
<i>Annona senegalensis</i>	Hur					
<i>Citrus aurantium</i>	Alum utiv					
20	<i>Ageratum conyzoides</i>	Ngokwase	L	Burnt and ashes applied to the affected part.	Until the problem is over.	Swollen body
	<i>Tridax procumbens</i>	Aninge kyomon				
	<i>Physalis angulata</i>	Tampue				
	<i>Strophanthus hispidus</i>	Agbur				
21	<i>Parkia biglobosa</i>	Nune	BK	PS	As long as the problem persist.	Amoebic
	<i>Citrus sinensis</i>	Alum	R			
22	<i>Gmelina arborea</i>	Malina	BK	BWD	1 cup morning & evening 7 to 14 days.	Fungi infection
	<i>Psidium guajava</i>	Gova	L			
	<i>Mangifera indica</i>	Murgur	BK			
23	<i>Khaya senegalensis</i>	Haa ukiriki	L	Pounded & apply to the west.	As long as the problem persist.	Waist pain
	<i>Annona senegalensis</i>	Anyamhul				
24	<i>Prosopis africana</i>	Gbaaye	R	BWD	7 days	Body weakness
	<i>Grewia venusta</i>	Hueza				
25	<i>Prosopis africana</i>	Gbaaye	B	Pounded & Drop the liquid in the affected part.	As long as possible.	Boils
26	<i>Daniella oliveri</i>	Chiha	BK	Pounded and apply to the affected part.	As long as the problem persist.	Stroke
27	<i>Landolphia oworiensis</i>	Ipungwa	R	BWD	7 days	Gonorrhea
28	<i>Boerhavia diffusa</i>	Mgbelayongo	T	Grinded & taken orally.	7 to 14 days	Weak erection
29	<i>Hibiscus asper</i>	Dedouko	L	Grinded & taken orally.	7 days	Difficulty in defecation
30	<i>Lawsonia inermis</i>	Lale	R	BWD	7 days	Abortion

31	<i>Gossypium spp.</i>	Mou	F	Put on fire & drop the liquid in the ear.	7 days	Ear pains
32	<i>Piliostigma thonningii</i>	Nyihar	L	Grinded & taken orally.	3 days	Running stomach
	<i>Sterculia setigera</i>	Kumeduur	R	SWD	3 days	
33	<i>Ocimum gratissimum</i>	Kungureku utamen	L	Squeeze and apply on the forehead.	1 time	Headache
34	<i>Stereospermum kunthianum</i>	Umanatumba	B	Grinded & taken orally.	7 days	Difficulty in getting pregnant
35	<i>Mucuna pruriens</i>	Imo	L	SWD	1 time	Blood shortage
36	<i>Ipomoea batatas</i>	Atsaka	L	BWD	7 to 14 days	Arthritis
	<i>Loranthus spp.</i>	Nonor				
	<i>Pterocarpus erinaceus</i>	Ngaji	R			
	<i>Biophytum petersianum</i>	Wuheniyough	WS	Grinded & apply to the affected part.	7 to 14 days	
37	<i>Ceiba pentandra</i>	Vambe	L	SWD	7 to 14 days	Smallpox
	<i>Justicia schimperi</i>	Tyengee				
38	<i>Uvaria chamae</i>	Ikyo	R	BWD	2 to 3 days	Pile

**Mode of preparation:** PS= Powder Swallow, SWD= Soak in water and drink, BWD= Boil in water and drink, Paste and Pomade, **Part used:** R= root, F=Fruits, L=Leaves, B=Branches, BK = Bark, BR=Branch and Root, T= Tuber, WS= Whole Stem and FL= Fruit and leaves

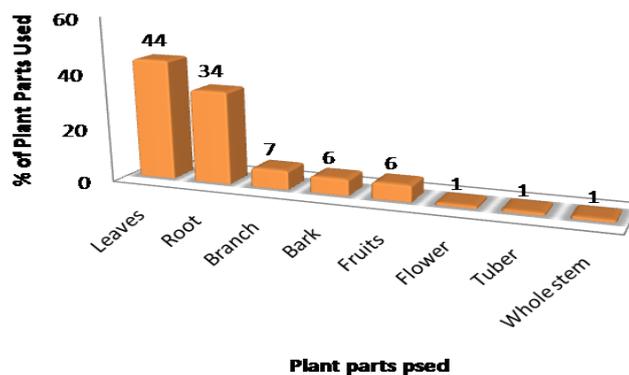
The family Meliaceae had the highest proportion of medicinal plants used (13%), followed by Fabaceae (11%), Lamiaceae (9%), Asteraceae (8%) Annonaceae (7%) and the remaining thirty five (35) families had (52%) as shown in Figure 3 below.



**Figure 3** Percentage distribution in families for medicinal plants used to treat different ailments

The most frequently utilized medicinal plant parts were leaves (44%), followed by roots (34%), branches (7%), bark and fruits (6%) and flower, tuber and whole stem (1%) respectively. This can be seen in figure 4.

Table 3 shows that the plant species used to treat the highest percentage of diseases was *Ocimum gratissimum*, reported to treat 7% of the diseases followed by *Annona senegalensis*, having 6% while *Khaya senegalensis* was reported to treat 5.2% of the diseases. This is displayed in the table below.



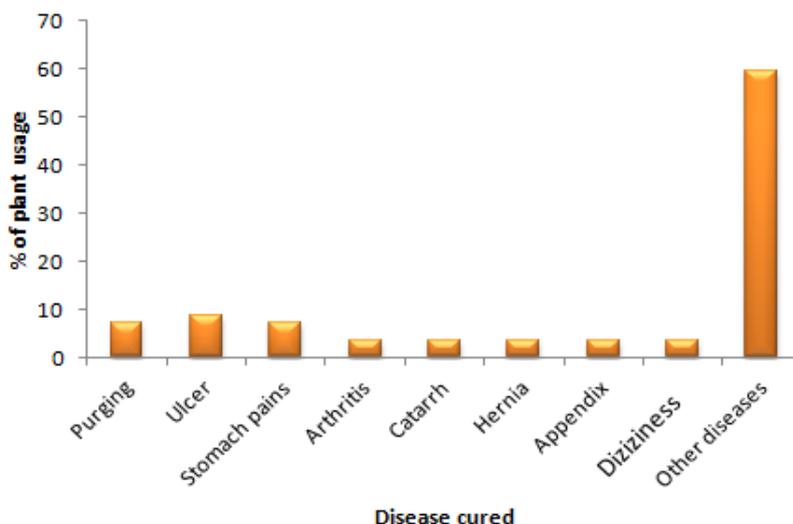
**Figure 4** Plant parts used for medicinal purposes

**Table 3** Most frequently utilized species

S/No.	Scientific Name	Frequency	%
1	<i>Ocimum gratissimum</i>	8	7.0
2	<i>Annona senegalensis</i>	7	6.1
3	<i>Khaya senegalensis</i>	6	5.2
4	<i>Mangifera indica</i>	5	4.3
5	<i>Bridelia ferruginea</i>	4	3.5
6	<i>Ficus thonningii</i>	4	3.5
7	<i>Gardenia erubescens</i>	4	3.5
8	<i>Maytenus senegalensis</i>	4	3.5
9	<i>Carica papaya</i>	3	2.6
10	<i>Erythrina senegalensis</i>	3	2.6
11	<i>Prosopis africana</i>	3	2.6
12	<i>Psidium guajava</i>	3	2.6
13	<i>Uvaria chamae</i>	3	2.6
14	<i>Ageratum conyzoides</i>	2	1.7
15	<i>Aspilia africana</i>	2	1.7
16	<i>Azadirachta indica</i>	2	1.7
17	<i>Citrus aurantium</i>	2	1.7
18	<i>Daniella oliveri</i>	2	1.7
19	<i>Ddeterium microcarpum</i>	2	1.7
20	<i>Lawsonia inermis</i>	2	1.7
21	<i>Physalis angulata</i>	2	1.7
22	<i>Piliostigma thonningii</i>	2	1.7
23	<i>Senna occidentalis</i>	2	1.7
24	<i>Smilax anceps</i>	2	1.7
25	<i>Smilax anceps</i>	2	1.7
26	<i>Sterculia setigera</i>	2	1.7
27	<i>Stereospermum kunthianum</i>	2	1.7
28	Other medicinal plants*	1	0.9

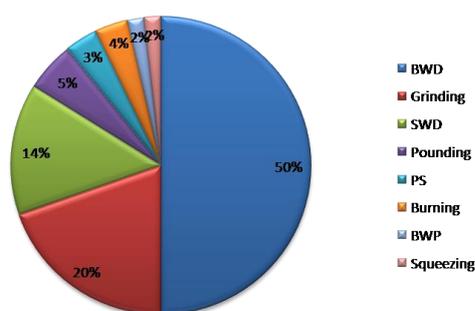
\* The Other plants include: *Boerhavia diffusa*, *Canthium spp.*, *Capsicum annum*, *Ceiba pentandra*, *Ceratotheca sesamoides*, *Citrus sinensis*, *Combretum molle*, *Eclipta alba*, *Erythroleum suaveolens*, *Gmelina arborea*, *Gossypium spp.*, *Grewia venusta*, *Hibiscus asper*, *Ipomoea batatas*, *Justicia schimperii*, *Lagenaria siceraria*, *Landolphia oworiensis*, *Loranthus spp.*, *Mucuna pruriens*, *Musa sapientum*, *Parkia biglobosa*, *Pistia stratiotes*, *Sarcocephalus latifolius*, *Strophanthus hispidus*, *Strychnos spinosa*, *Terminalia avicemiodes*, *Trema orienalis*, *Tridax procumbens*, *Vitellaria paradoxa*

In terms of frequency of medicinal plant usage, the highest percentage of plant species (9%) was used to treat Ulcers, followed by Purging and Stomach pains (7%) and Arthritis, Catarrh, Hernia, Appendix and Dizziness were 4% respectively.



**Figure 5** Frequency of medicinal plants used to cure diseases

Most of the plant medicines were prepared by boiling in water (50%), grinding (20%), soaking in cold water (14%), pounding (5%), burning (4%), powder swallow (3%) squeezing and boiling water for pressing (2%) respectively as shown in figure 7.



**Figure 6** Methods of medicinal plants preparation in the study area

(PS= Powder Swallow, SWD= Soak in water and drink and BWD= Boil in water and drink)

#### 4. Discussion

In this study, a total of fifty-nine medicinal plant species in forty-one families were recorded. This revealed a rich diversity of medicinal plants in Nyiev and Mbawa communities. It further revealed a rich ethnobotanical knowledge amongst the residents of the host communities of the University of Agriculture Makurdi.

About 80% of all the medicinal plants recorded were collected from the wild; only 20% were collected from cultivated (home garden). Well over 50% of them are used to treat only one type of ailment while some are used to treat more than one kind of ailment.

The families Fabaceae and Asteraceae, which were amongst the most dominant in this study, are consistently recorded in other ethnobotanical studies [18-19], and could be likened to their wide range of bioactive ingredients [20-21].

Collections of medicinal plants mostly from the wild may be due to the difficulty in domesticating some indigenous plants. This however, draws attention to the need to train/educate the medicinal plant users on the right propagation

techniques of these plant species for sustainable utilization. The increased percentage of species obtained from the wild has a direct effect on the availability of these resources and is likely to contribute to their vulnerability to being over exploited.

It was observed that the majority of the informants interviewed were aged above 45 years, which agrees with [19]. This means that the elderly people are the holders of the knowledge of traditional medicine, and this implies that the knowledge about medicinal plants is at stake if the young generations are not being trained to use and/or take over from the elders.

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## 5. Conclusion

According to the research findings; different species of plants are used for the treatment of the same ailments in different locations of the study area. Few women and youths are involved in Traditional Medical Practice in the study area. Appropriate dosage has not been administered by the Traditional Medical Practitioners in the study area, as the dosage is not standardized. Some of the Traditional Medical Practitioners in the study area were not ready to open up the ailments they used the plant species mentioned to treat. Some medicinal plants in the study area are already in extinction because of indiscriminate logging, deforestation, overuse/harvesting for the purpose of medicine. It is therefore recommended that the flora of the place should be preserved to prevent extinction and there is need to educate the youth on herbal medicine as it can serve as a dependable source of employment.

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## Compliance with ethical standards

### *Acknowledgments*

The authors are grateful to all the indigenous people of Nyiev and Mbawa Districts, Makurdi, who provided useful information for the success of this study.

### *Disclosure of conflict of interest*

The authors declare that they have no conflict of interests.

### *Statement of informed consent*

Permission was obtained from the local chiefs before questionnaire was administered.

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