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Full Length Research Article

PLANT USE KNOWLEDGE AND QUANTITATIVE ANALYSIS OF SOME MEDICINAL PLANTS FROM ONDO STATE, SOUTHWESTERN NIGERIA

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ABSTRACT
This study was conducted to investigate the plants used medicinally in rural and semi-urban areas of Ondo State, Nigeria with a view to generating a comprehensive list of therapeutic plants and evaluating their importance quantitatively. Surveys were conducted in some communities in Ondo State between November 2021 and November 2022 with focus on different uses of plants. Structured questionnaires were administered to plant collectors and users. Data were analyzed based on some ethnobotanical indices. In total, 179 medicinal plants belonging to 66 plant families were recorded. The family Fabaceae had the highest (16.20%) representative species while shrubs formed the most used plant form (32%). The highest Frequency of Citation (FC, 49) was obtained for *Azadirachta indica*. The most valuable plant was *A. indica* (0.17) based on the Relative Frequency of Citation (RFC) and highest (1.67) Use Value (UV). The Consensus Index and Fidelity Level (FL) were also found to be highest with *A. indica* (50% and 83.33% respectively) while Fabaceae had the highest Family Importance Value (FIV, 10.98%). The ethnomedicinal use of *A. indica, V. amygdalina* etc. in the treatment of malaria/fever has been further confirmed in this study. The family Fabaceae has been shown to contain plant species that are important to the informants. The use of quantitative techniques in ethnomedicinal studies allows the identification of commonly used plants and their recommendation for pharmacological research to confirm traditional claims. There is need to properly educate plant users in the communities on the sustainable use of plant resources.

Keywords: Ethnobotany, Biodiversity, Floristic composition, Ondo State, Nigeria.

INTRODUCTION

Plants are the basis of many indigenous health practices in most African communities (Bussmann, 2006) since majority of the populations rely on medicinal plants for their health needs. As plants are playing increasing roles in alleviating human health, ethnobotanical studies are yielding a wealth of information about various plants and their usefulness to people from different cultural backgrounds. Besides the medicinal uses, plants also serve the purposes of food, fiber, fuel, construction, ornament, religious ceremonies etc. According to WHO (1978), worldwide, 25% of prescription drugs are derived from medicinal plants that have been used by indigenous or traditional people over and over, for a long period of time. Even in developing countries of West Africa, about 80% of the population use herbal medicines for their health needs. Ethnomedicine (a sub-field of ethnobotany) deals with the study of traditional medicines with focus on indigenous perception and use of these medicines as well as drug discovery and development.

The south-western part of Nigeria, with vegetation made up of fresh water swamp and mangrove forest, is blessed with many species of plants that are used both as food and medicines. Ondo State, particularly, has both a mangrove-swamp forest and tropical rain forest. The tropical rainforest is well known as a biological hotspot, and several species of plants have found place in traditional medicinal practice. Several studies have been conducted in the south-western part of Nigeria to showcase the importance of plants in human welfare (Adjanohoun *et al.,* 1991; Abo *et al.,* 2000, 2008). Demographic, cultural, socio-economic, and geographical factors are known to influence how indigenous communities use plants (Byg and Baslev, 2001; Erinoso and Aworinde, 2012).

The importance of quantitative analysis of ethnobotanical data has been highlighted by many workers in the field of botany, ethnobotany, ethnoecology, conservation biology, and cultural anthropology (Prance *et al.,* 1987; Phillips and Gentry, 1993a, b; Phillips *et al.,* 1994; Hoft *et al.,* 1999; Hoffman and Gallaher, 2007; Albuquerque, 2009). Quantitative methods have proved very reliable in the selection of useful or most efficacious species among plant species implicated in ethnobotanical surveys (Moermann, 1989). More often than not, these plants are important across cultures, and are frequently mentioned in ethnobotanical inventories. As part of their activities, ethnobotanists use quantitative techniques to test hypothesis on plant-people interaction (Gomez-Beloz, 2002). Quantitative ethnobotanical studies are also important for cross-cultural comparison of plant uses, and consequently hypothesis-testing for plant resource usage, management, and conservation. The purpose of this article was to present the results of the survey on utilization of medicinal plants in some communities in Ondo State, and to use quantitative ethnobotanical indices to show the value of the plant species and families.

MATERIALS AND METHODS

Study Areas: Ondo State has three (3) Senatorial Districts (SDs) (Ondo North, Ondo South, and Ondo Central) with 18 Local Government Areas (LGAs). Purposive sampling was used and three (3) LGAs were selected from each of the SDs. The study was therefore conducted in 9 LGAs of Ondo State, Nigeria (Fig. 1). Ondo State, with capital at Akure, is bounded by Ekiti State (to the north), Edo State (to the east), Ogun State (to the west) and Atlantic Ocean (to the South). It covers a land area of 14,793 square kilometers with a population of 3,441,024 based on 2006 census

record. The state has tropical rain forest with distinct wet and dry seasons. Annual rainfall ranges from 1,150 to 2,000mm and temperature ranges from 27 to 30ºC with relative humidity ranging between 70 – 75%. Ondo State soil is brown to orange sandy and light grey in coastal or riverine areas (Falodun, 2017). The state is predominantly occupied by the Yoruba-speaking tribal groups of Akure, Akoko, Owo, Ondo, Ikale and Ilaje and few others who speak a variant of the Yoruba language of neighbouring towns. The state is also home to the Ijaw people with economic interests in petroleum, cocoa, and fishing business. Some of the people in the state are civil servants while majority, especially in the rural and semi-urban areas engage in farming, fishing, and processing of farm products like cassava, palm oil etc.

Questionnaires and Interviews: The need for questionnaires in ethnobotanical research has been made by Gomez-Beloz (2002). A semi-structured questionnaire was designed to elicit information from respondents (farmers, traders, artisans, civil servants) in the study communities. The questionnaire had two sections. Section A captured the demographic variables of the respondents while Section B covered plants used in the treatment of various ailments, plant parts used, methods of preparation, and modes of administration. The ease of collection and proximity of collection sites were also assessed in Section B of the questionnaire.

Field Surveys and Plant Collection: Field surveys were conducted immediately after administration of questionnaires and interviews to collect plants used medicinally in the localities. Leafy twigs with flowers or seeds or fruits were collected. Plant specimens were assigned collection numbers and were carefully placed in the field presser. Photographs of plants were also taken for proper identification.

Plant Identification and Preservation: Plant specimens were identified using the Flora of West Tropical Africa (Hutchinson and Dalziel, 1958), Nigerian Trees (Keay *et al.,* 1964), and Handbook of West African Weeds (Akobundu and Agyakwa, 1998). University of Ibadan Herbarium (UIH) and Forestry Research Institute of Ibadan Herbarium (FHI) were also consulted. Voucher specimens were prepared for all pressed plant specimens and deposited in OAUSTECH herbarium.

Quantitative Analysis of Data: Different quantitative ethnobotanical indices (Hoffman and Gallaher, 2007; Rehman *et al.,* 2022) such as Frequency of Citation (FC), Relative Frequency of Citation (RFC), Use Reports (UR), Use Value (UV), Consensus Index (CI), Fidelity Level (FL), and Family Importance Value (FIV) were used to evaluate the uses of plants mentioned by the respondents.

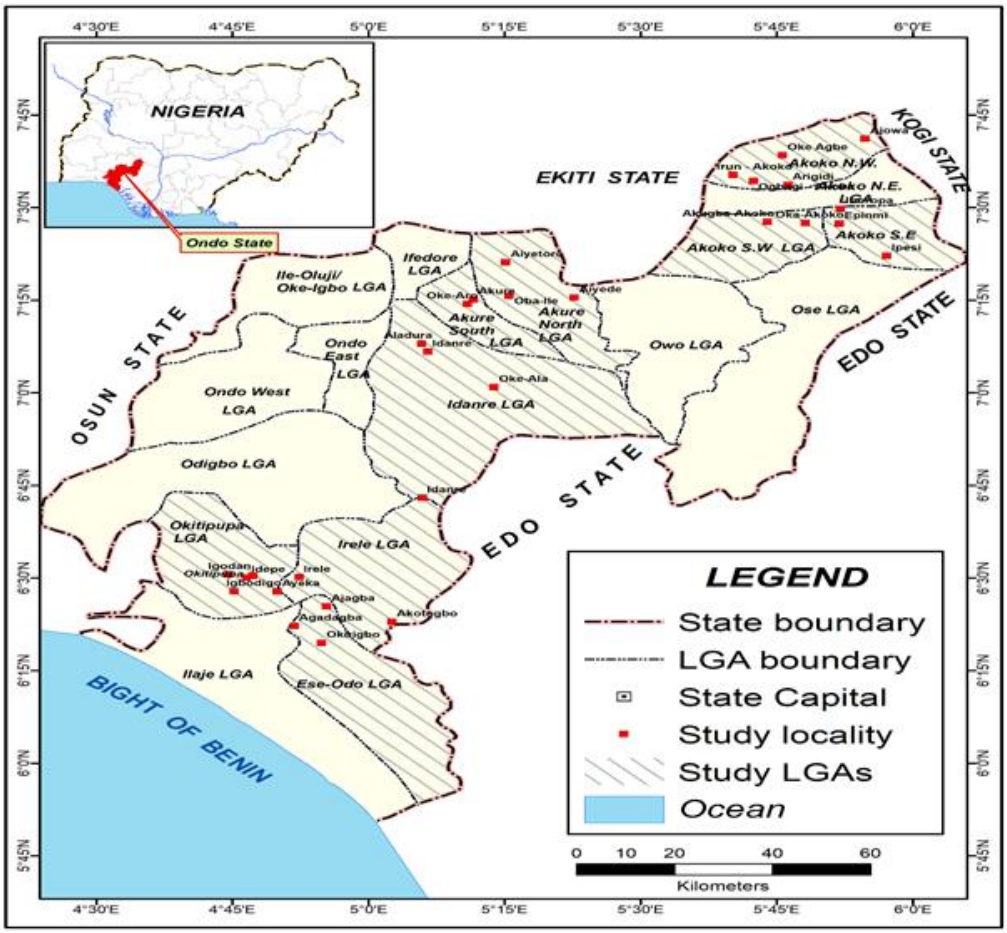

Fig. 1: Map of Ondo State indicating the study areas and locations where plants were collected during the study (map was designed using ArcGIS 10.3

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RESULTS

Demography of Respondents: Table 1 shows the demographic variables of the respondents. In all, 368 participants were interviewed but only complete information supplied by 296 respondents were used in the data analysis. Age of respondents ranged from 20 to 72 years. 14 (4.73%) of the informants were in the age range 15 – 20 years, 22 (7.43%) fell within the age bracket 20 – 30 years, 80 (27.03%) were in the range 30 – 40 years, 54 (18.24%) fell within the range 40 – 50 years. Also, 90 (30.41%) of the informants were between 50 – 60 years, 34 (11.49%) were between 60 and 70 years, while 2 (0.68%) of the informants were over 70 years old. 172 (58.11%) of the respondents were males while 124 (41.89%) were females. 232 (78.38%) of the informants were married, 34 (11.49%) while 34 (11.49%) were single; others, 30 (10.14%) were either divorced or widowed. 228 (77.03%) of the informants practiced Christianity while 42 (14.19%) and 26 (8.78%) practiced Islam and African traditional religion respectively. 76 (25.68%) of the participants had First School Leaving Certificate (FSLC), 68 (22.97%) had Senior School Certificate, 38 (12.84%) had Ordinary National Diploma or Nigerian Certificate in Education while 8 (2.70%) possessed higher degrees. 234 (79.05%) were natives of the communities while 62 (20.95%) were non-natives

Table 1: Demographic variables of respondents (N=296)

Variable	Categories	No. of Informants	Percentage (%)
Age	≥15 ≤ 20 years	14	4.73
	>20 ≤ 30 years	22	7.43
	>30 ≤ 40 years	80	27.03
	>40 ≤ 50 years	54	18.24
	>50 ≤ 60years	90	30.41
	>60 ≤ 70 years	34	11.49
	>70 years	2	0.68
Gender	Male	172	58.11
	Female	124	41.89
Marital Status	Single	34	11.49
	Married	232	78.38
	Others	30	10.14
Religion	Christianity	228	77.03
	Islam	42	14.19
	Traditional	26	8.78
Level of Education	FSLC	76	25.68
	Secondary	68	22.97
	OND/NCE	38	12.84
	HND/First Degree	106	71.62
	Higher Degree	8	2.70
Nativity	Yes	234	79.05
	No	62	20.95
Primary Occupation	Farming	78	26.35
	Trading	72	24.32
	Civil Servant	98	33.11
	Artisan	32	10.81
	Others	16	5.41

Medicinal Plants Diversity and Uses: Information on medicinal plants, families, life forms, part(s) used, and medical indications of plants used in some communities in Ondo State are presented in Table 2. In total, 179 medicinal plants belonging to 66 plant families were recorded to be used in the management of 54 medical conditions in the study areas. The family Fabaceae had the highest number of quoted species (29) while diarrhoea was the most commonly treated ailment using 16 different plant species.

Habits of Plants Used in the Study Areas: The most dominant life form of the plants used in the study areas was shrub (58 species, 32%), closely followed by herb (55 species, 31%) and tree (54 species, 30%). Climbers including climbing vines (6 species, 3%) and creepers (3 species, 2%) were also used while liana and vines each had 1% (Fig. 2).

Commonly Used Plant Parts: The leaf (44.13%) formed the most commonly used plant part, followed by the stem bark (17.88%), whole plant (12.29%) and fruit (8.94%). Other plant parts mentioned by the informants are: rhizome, tuber, twig, bulb, latex, gum, and inflorescence (Fig. 3).

Method of Preparation and Administration: Methods of preparation were majorly decoction and infusion and the plant preparations were administered orally, especially for ailments that affect the internal organs of the body. For diseases of the skin or other conditions that show outward signs (e.g. rashes, sores/wounds, snakebite, whitlow etc.), the methods of preparation were topical/paste, ointment, or plant extracts applied to the ailing part of the body.

Quantitative Analyses: Table 2 shows the summary of the ethnobotanical indices assessed in this study. The Frequency of Citation (FC) ranged from 4 to 49 for different plant species mentioned during the study. The 10 most cited plants were *Azadirachtha indica* (49), *Boerhavia diffusa* (44), *Ageratum conyzoides* (39), *Citrus limon* (39), *Garcinia kola* (39), *Momordica charantia* (39), *Vernonia amygdalina* (39), *Carica papaya* (29), *Citrus aurantium* (29), and *Psidium guajava* (29). The Relative Frequency of Citation (RFC) ranged from 0.01 to 017. The top 10 valuable plant species based on RFC values were in the order listed above. The Use Reports (UR) were highest in the plants listed above; and the values ranged from 4 to 27 while the Use Values (UV) ranged between 0.17 and 1.67. The Consensus Index (CI) and Fidelity Level (FL) were highest (50% and 83.33% respectively) with *A. indica* (family Meliaceae). However, Fabaceae (29 species, FC = 166, FIV = 10.98%), Asteraceae (10 species, FC = 150, FIV = 9.92%), Apocynaceae (7 species, FC = 83, FIV = 5.49%), Euphorbiaceae (8 species, FC = 72, FIV = 4.76%), and Cucurbitaceae (8 species, FC = 66, FIV = 4.37%) were the most cited plant families in the top 5 category.

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Table 2: Quantitative analysis of medicinal plants used in some communities in Ondo State for the treatment of various ailments

S/N	Plant	Family	Habit	Part(s) Used	Indication	FC	RFC	UR	UV	CI (%)	FL (%)
1	*Abrus precatorius*	Fabaceae	Herb	WP	Infertility	24	0.08	14	0.83	25.00	41.67
2	*Ageratum conyzoides*	Asteraceae	Herb	WP	Infertility	39	0.13	22	1.33	40.00	66.67
3	*Albizia zygia*	Fabaceae	Tree	L	Constipation	4	0.01	4	0.17	5.00	8.33
4	*Allophyllus africanus*	Sapindaceae	Tree	L, SB	Infertility	4	0.01	4	0.17	5.00	8.33
5	*Alstonia boonei*	Apocynaceae	Tree	SB	Asthma	14	0.05	9	0.50	15.00	25.00
6	*Annona senegalensis*	Annonaceae	Shrub	L	Chest Pain	4	0.01	4	0.17	5.00	8.33
7	*Anthonotha macrophylla*	Fabaceae	Shrub	SB	Gonorrhea	4	0.01	4	0.17	5.00	8.33
8	*Arachis hypogea*	Fabaceae	Herb	L	Cataract	9	0.03	7	0.33	10.00	16.67
9	*Aristolachia ringens*	Aristolochiaceae	Climber	WP	Skin Diseases	4	0.01	4	0.17	5.00	8.33
10	*Asparagus africanus*	Asparagaceae	Shrub	WP	Sores/Wounds	4	0.01	4	0.17	5.00	8.33
11	*Aspilia africana*	Asteraceae	Herb	L	Diarrhoea/Hepatitis	14	0.05	9	0.50	15.00	25.00
12	*Asystacia gangetica*	Acanthaceae	Herb	WP	Asthma/Snakebite	14	0.05	9	0.50	15.00	25.00
13	*Azadirachta indica*	Meliaceae	Tree	L, SB	Malaria	49	0.17	27	1.67	50.00	83.33
14	*Bambusa vulgaris*	Poaceae	Shrub	L	Gonorrhea	19	0.06	12	0.67	20.00	33.33
15	*Baphia nitida*	Fabaceae	Shrub	L, SB, R	Skin Diseases	4	0.01	4	0.17	5.00	8.33
16	*Bidens pilosa*	Asteraceae	Herb	WP	Labour/Delivery	4	0.01	4	0.17	5.00	8.33
17	*Bixa orellana*	Bixaceae	Shrub	F, S	Malaria	4	0.01	4	0.17	5.00	8.33
18	*Blighia sapida*	Sapindaceae	Tree	L, SB	Dysentery	4	0.01	4	0.17	5.00	8.33
19	*Boerhavia coccinea*	Nyctaginaceae	Herb	WP	Miscarriage	4	0.01	4	0.17	5.00	8.33
20	*Boerhavia diffusa*	Nyctaginaceae	Herb	WP	Miscarriage/Hepatitis/Asthma	44	0.15	24	1.50	45.00	75.00
21	*Bridelia ferruginea*	Phyllanthaceae	Shrub	L, SB, R	Diabetes	4	0.01	4	0.17	5.00	8.33
22	*Bryophyllum pinnatum*	Crassulaceae	Herb	L	Wounds	9	0.03	7	0.33	10.00	16.67
23	*Burkea africana*	Fabaceae	Tree	SB	Headache	4	0.01	4	0.17	5.00	8.33
24	*Caesalpinia bonduc*	Fabaceae	Shrub	L, R	Fever	4	0.01	4	0.17	5.00	8.33
25	*Cajanus cajan*	Fabaceae	Shrub	L, S	Measles/Chicken Pox	14	0.05	9	0.50	15.00	25.00
26	*Caladium bicolor*	Araceae	Herb	L, Rh	Wounds	4	0.01	4	0.17	5.00	8.33
27	*Calliandra portoricensis*	Fabaceae	Shrub	L, R	Stomach Disorder	4	0.01	4	0.17	5.00	8.33
28	*Calotropis procera*	Apocynaceae	Shrub	L, R	Abortifacient	24	0.08	14	0.83	25.00	41.67
29	*Canna indica*	Cannaceae	Herb	L	Asthma	4	0.01	4	0.17	5.00	8.33
30	*Carica papaya*	Caricaeae	Tree	L	Hepatitis/Malaria	29	0.10	17	1.00	30.00	50.00
31	*Carissa edulis*	Apocynaceae	Tree	L, R	Chest Pain/Asthma/Cough	14	0.05	9	0.50	15.00	25.00
32	*Carpolobia lutea*	Polygalaceae	Shrub	L. SB	Rheumatism	4	0.01	4	0.17	5.00	8.33
33	*Ceiba pentandra*	Malvaceae	Tree	L, SB	Diabetes	4	0.01	4	0.17	5.00	8.33
34	*Celosia argentea*	Amaranthaceae	Herb	L	Constipation	14	0.05	9	0.50	15.00	25.00
35	*Centrosema pubescens*	Fabaceae	Herb	L	Skin Diseases	4	0.01	4	0.17	5.00	8.33
36	*Chromolaena odorata*	Astercaeae	Shrub	L	Wounds	24	0.08	14	0.83	25.00	41.67
37	*Chrysophyllum albidum*	Sapotaceae	Tree	L, SB	Stomach Disorder	4	0.01	4	0.17	5.00	8.33
38	*Cietopholis patens*	Annonaceae	Tree	L, SB	Tuberculosis	4	0.01	4	0.17	5.00	8.33
39	*Cissus populnea*	Vitaceae	Shrub	R	Miscarriage/Low Sperm Count	9	0.03	7	0.33	10.00	16.67
40	*Citrus aurantium*	Rutaceae	Tree	F	Stomach Disorder	29	0.10	17	1.00	30.00	50.00
41	*Citrus limon*	Rutaceae	Tree	F	Stomach Disorder	39	0.13	22	1.33	40.00	66.67
42	*Citrus sinensis*	Rutaceae	Tree	F, SB	Fever	9	0.03	7	0.33	10.00	16.67
43	*Clausena anisata*	Rutaceae	Shrub	L, SB	Abdominal Pain	9	0.03	7	0.33	10.00	16.67
44	*Clerodendrum volubile*	Lamiaceae	Shrub	L, R	Venereal Diseases	4	0.01	4	0.17	5.00	8.33
45	*Cnestis ferruginea*	Connaraceae	Shrub	L, SB, R	Oral Infections	4	0.01	4	0.17	5.00	8.33
46	*Coffea arabica*	Rubiaceae	Shrub	S	Stimulant	4	0.01	4	0.17	5.00	8.33
47	*Cola acuminata*	Malvaceae	Tree	S	Stimulant	14	0.05	9	0.50	15.00	25.00
48	*Colocasia esculenta*	Araceae	Herb	Tu	Poison Antidote	4	0.01	4	0.17	5.00	8.33
49	*Combretum platypetalum*	Combretaceae	Shrub	L	Diarrhoea	4	0.01	4	0.17	5.00	8.33
50	*Combretum racemosum*	Combretaceae	Shrub	Tw	Appetizer	4	0.01	4	0.17	5.00	8.33
51	*Combretum paniculatum*	Combretaceae	Creeper	L, SB	Miscarriage	4	0.01	4	0.17	5.00	8.33
52	*Corchorus olitorius*	Malvaceae	Herb	L	Asthma	19	0.06	12	0.67	20.00	33.33

53	*Costus afer*	Costaceae	Herb	F, R	Jaundice	4	0.01	4	0.17	5.00	8.33
54	*Crassocephalum rubens*	Asteraceae	Herb	L	Stomach Disorder	4	0.01	4	0.17	5.00	8.33
55	*Crinum jagus*	Amaryllidaceae	Herb	L, Bu	Cough	4	0.01	4	0.17	5.00	8.33
56	*Crotalaria retusa*	Fabaceae	Herb	L, R	Dysentery	4	0.01	4	0.17	5.00	8.33
57	*Croton zambesicus*	Euphorbiaceae	Shrub	L	Impotence	4	0.01	4	0.17	5.00	8.33
58	*Cucurbita pepo*	Cucurbitaceae	Creeper	F	Urinary Infections	4	0.01	4	0.17	5.00	8.33
59	*Curculigo pilosa*	Hypoxidaceae	Herb	R	Gonorrhea	4	0.01	4	0.17	5.00	8.33
60	*Curcuma longa*	Zingiberaceae	Herb	Tu	Skin Diseases	4	0.01	4	0.17	5.00	8.33
61	*Cymbopogon citratus*	Poaceae	Herb	L, R	Malaria	4	0.01	4	0.17	5.00	8.33
62	*Cynodon dactylon*	Poaceae	Grass	L	Urinary Infections	4	0.01	4	0.17	5.00	8.33
63	*Cyperus esculentus*	Cyperaceae	Herb	WP	Menstrual Disorder	4	0.01	4	0.17	5.00	8.33
64	*Dacryodes edulis*	Burseraceae	Tree	L, F	Skin Diseases	4	0.01	4	0.17	5.00	8.33
65	*Daniellia oliveri*	Fabaceae	Tree	SB, Gum	Urinary Infections	9	0.03	7	0.33	10.00	16.67
66	*Datura metel*	Solanaceae	Shrub	L	Asthma	4	0.01	4	0.17	5.00	8.33
67	*Datura stramonium*	Solanaceae	Herb	L	Asthma	4	0.01	4	0.17	5.00	8.33
68	*Dennettia tripetala*	Annonaceae	Tree	L, F	Cough/Nausea	4	0.01	4	0.17	5.00	8.33
69	*Desmodium gangeticum*	Fabaceae	Shrub	L, R	Urinary Infections	4	0.01	4	0.17	5.00	8.33
70	*Dialium guineense*	Fabaceae	Tree	L, F	Cough	4	0.01	4	0.17	5.00	8.33
71	*Dichapetalum toxicarium*	Dichapetalaceae	Shrub	L, SB	Asthma	4	0.01	4	0.17	5.00	8.33
72	*Dioclea reflexa*	Fabaceae	Shrub	S	Asthma	9	0.03	7	0.33	10.00	16.67
73	*Dioscorea dumetorum*	Dioscoreaceae	Shrub	L, Tu	Abdominal Pain	4	0.01	4	0.17	5.00	8.33
74	*Eleucine indica*	Poaceae	Grass	L	Cough	4	0.01	4	0.17	5.00	8.33
75	*Emilia coccinea*	Asteraceae	Herb	L, R	Ulcer	4	0.01	4	0.17	5.00	8.33
76	*Enantia chorantha*	Annonaceae	Tree	SB	Hepatitis	4	0.01	4	0.17	5.00	8.33
77	*Entandrophragma cylindricum*	Meliaceae	Tree	SB	Diabetes	4	0.01	4	0.17	5.00	8.33
78	*Erythrophleum suaveolens*	Fabaceae	Tree	L, SB	Snakebite	4	0.01	4	0.17	5.00	8.33
79	*Euphorbia heterophylla*	Euphorbiaceae	Herb	L, SB	Gonorrheoa	4	0.01	4	0.17	5.00	8.33
80	*Euphorbia hirta*	Euphorbiaceae	Herb	WP	Asthma	29	0.10	17	1.00	30.00	50.00
81	*Ficus asperifolia*	Moraceae	Shrub	L	Wounds	9	0.03	7	0.33	10.00	16.67
82	*Ficus exasperata*	Moraceae	Tree	L, SB	Urinary Infections	4	0.01	4	0.17	5.00	8.33
83	*Ficus sur*	Moraceae	Tree	L, SB	Infertility	4	0.01	4	0.17	5.00	8.33
84	*Ficus thonningii*	Moraceae	Tree	L	Cataract	4	0.01	4	0.17	5.00	8.33
85	*Garcinia kola*	Clusiaceae	Tree	S, SB	Cough	39	0.13	22	1.33	40.00	66.67
86	*Gongronema latifolium*	Asclepidiaceae	Shrub	SB	Oral Infections	4	0.01	4	0.17	5.00	8.33
87	*Gossypium barbadensis*	Malvaceae	Shrub	L, S	Menstrual Disorder	4	0.01	4	0.17	5.00	8.33
88	*Grewia venusta*	Tiliaceae	Herb	L, R	Diarrhoea	4	0.01	4	0.17	5.00	8.33
89	*Harungana madagascariensis*	Hypericaceae	Tree	L, SB	Hepatitis/Jaundice	14	0.05	9	0.50	15.00	25.00
90	*Holarrhena floribunda*	Apocynaceae	Tree	L, SB	Infertility	4	0.01	4	0.17	5.00	8.33
91	*Hoslundia opposita*	Lamiaceae	Shrub	WP	Abdominal Pain	4	0.01	4	0.17	5.00	8.33
92	*Hyptis suaveolens*	Lamiaceae	Herb	L	Malaria	4	0.01	4	0.17	5.00	8.33
93	*Icanina trichantha*	Icacinaceae	Shrub	L, R	Rheumatism	4	0.01	4	0.17	5.00	8.33
94	*Ipomoea involucrata*	Convolvulaceae	Herb	L	Gynecological Diseases	4	0.01	4	0.17	5.00	8.33
95	*Irvingia gabonensis*	Irvingiaceae	Tree	L	Spleen Infections	4	0.01	4	0.17	5.00	8.33
96	*Jatropha curcas*	Euphorbiaceae	Shrub	L, S	Whitlow	4	0.01	4	0.17	5.00	8.33
97	*Jatropha gossypifolia*	Euphorbiaceae	Shrub	Latex	Skin Diseases	4	0.01	4	0.17	5.00	8.33
98	*Justicia carnea*	Acanthaceae	Shrub	L	Blood Shortage	9	0.03	7	0.33	10.00	16.67
99	*Kalanchoe crenata*	Crassulaceae	Herb	L	Earache	4	0.01	4	0.17	5.00	8.33
100	*Khaya ivorensis*	Meliaceae	Tree	SB	Malaria	4	0.01	4	0.17	5.00	8.33
101	*Kigelia Africana*	Bignoniaceae	Tree	F	Infertility	4	0.01	4	0.17	5.00	8.33
102	*Landolphia dulcis*	Apocynaceae	Liane	R	Low Sperm Count	4	0.01	4	0.17	5.00	8.33
103	*Lantana camara*	Verbenaceae	Shrub	L,S	Hepatitis/Fever	24	0.08	14	0.83	25.00	41.67
104	*Lippia multiflora*	Verbenaceae	Tree	L	Chest Pain	4	0.01	4	0.17	5.00	8.33

105	*Lycopersicon esculentum*	Solanaceae	Herb	L, F	Constipation	4	0.01	4	0.17	5.00	8.33
106	*Mangifera indica*	Anacardiaceae	Tree	L, SB	Malaria	34	0.11	19	1.17	35.00	58.33
107	*Manihot esculentum*	Euphorbiaceae	Shrub	L, Tu	Gonorrhea	4	0.01	4	0.17	5.00	8.33
108	*Markhamia tomentosa*	Bignoniaceae	Shrub	L	Rheumatism	4	0.01	4	0.17	5.00	8.33
109	*Maytenus senegalensis*	Celastraceae	Shrub	L	Diarrhoea	4	0.01	4	0.17	5.00	8.33
110	*Microdesmis puberula*	Pandaceae	Shrub	L, SB	Diarrhoea	4	0.01	4	0.17	5.00	8.33
111	*Mimosa pudica*	Fabaceae	Creeper	L	Boil	4	0.01	4	0.17	5.00	8.33
112	*Momordica charantia*	Cucurbitaceae	Climber	L	Malaria/Fever/Diabetes	39	0.13	22	1.33	40.00	66.67
113	*Momordica foetida*	Cucurbitaceae	Climber	L	Diabetes	4	0.01	4	0.17	5.00	8.33
114	*Mondia whitei*	Periplocaceae	Climber	WP	Malaria	4	0.01	4	0.17	5.00	8.33
115	*Monodora myristica*	Annonaceae	Tree	S	Cough	4	0.01	4	0.17	5.00	8.33
116	*Morinda lucida*	Rubiaceae	Tree	L, SB	Malaria	19	0.06	12	0.67	20.00	33.33
117	*Moringa oleifera*	Moringaceae	Tree	L, R	Inflammation	14	0.05	9	0.50	15.00	25.00
118	*Mucuna flagellipes*	Fabaceae	Climber	F	Urinary Infections	4	0.01	4	0.17	5.00	8.33
119	*Musa paradisiaca*	Musaceae	Herb	L, R, F	Gonorrhea/Diabetes	4	0.01	4	0.17	5.00	8.33
120	*Nauclea diderichii*	Rubiaceae	Tree	SB, R	Rheumatism/Gonorrhea	4	0.01	4	0.17	5.00	8.33
121	*Nauclea latifolia*	Rubiaceae	Tree	SB, R	Menstrual Disorder	4	0.01	4	0.17	5.00	8.33
122	*Newbouldia laevis*	Bignoniaceae	Tree	L, SB	Infertility	9	0.03	7	0.33	10.00	16.67
123	*Nicotiana tabacum*	Solanaceae	Herb	L	Asthma/Ulcer	9	0.03	7	0.33	10.00	16.67
124	*Ocimum gratissimum*	Lamiaceae	Herb	L	Diabetes/Fever/Diarrhoea	4	0.01	4	0.17	5.00	8.33
125	*Oldenlandia affinis*	Rubiaceae	Herb	WP	Diarrhoea	4	0.01	4	0.17	5.00	8.33
126	*Parinari macrophylla*	Chrysobalanaceae	Shrb	F	Skin Diseases	4	0.01	4	0.17	5.00	8.33
127	*Parkia biglobosa*	Fabaceae	Tree	L, S	HBP	4	0.01	4	0.17	5.00	8.33
128	*Pavetta corymbosa*	Rubiaceae	Shrub	L, R	Chest Pain	4	0.01	4	0.17	5.00	8.33
129	*Peperomia pellucida*	Piperaceae	Herb	WP	HBP	9	0.03	7	0.33	10.00	16.67
130	*Pergularia daemia*	Asclepidiaceae	Vine	L, SB, R	Ocular Diseases	4	0.01	4	0.17	5.00	8.33
131	*Persea Americana*	Lauraceae	Tree	F	HPB	4	0.01	4	0.17	5.00	8.33
132	*Petiveria alliacea*	Petiveriaceae	Shrub	L	Diabetes/Body Pain	4	0.01	4	0.17	5.00	8.33
133	*Phyllanthus amarus*	Phyllanthaceae	Herb	WP	Diabetes/Asthma	4	0.01	4	0.17	5.00	8.33
134	*Phyllanthus muellerianus*	Phyllanthaceae	Herb	WP	Dysentery	4	0.01	4	0.17	5.00	8.33
135	*Piper guineense*	Piperaceae	Climber	F	Cough/Mental Disorder	9	0.03	7	0.33	10.00	16.67
136	*Plumbago zeylanica*	Plumbaginaceae	Herb	L, R	Rheumatism	4	0.01	4	0.17	5.00	8.33
137	*Psidium guajava*	Myrtaceae	Tree	L, SB	Dysentery/Fever	29	0.10	17	1.00	30.00	50.00
138	*Pterocapus angolensis*	Fabaceae	Tree	L	Diarrhoea	4	0.01	4	0.17	5.00	8.33
139	*Pterocarpus erinaceus*	Fabaceae	Tree	L, SB	Dysentery	4	0.01	4	0.17	5.00	8.33
140	*Pterocarpus osun*	Fabaceae	Tree	SB, R	Skin Diseases	4	0.01	4	0.17	5.00	8.33
141	*Rauvolfia vomitoria*	Apocynaceae	Shrub	L, SB	Mental Disorder/HBP	19	0.06	12	0.67	20.00	33.33
142	*Ricinus communis*	Euphorbiaceae	Shrub	R	Hepatitis/Diarrhoea/Cataract	14	0.05	9	0.50	15.00	25.00
143	*Scoparia dulcis*	Plantaginaceae	Herb	WP	Gonorrhea/Diabetes	4	0.01	4	0.17	5.00	8.33
144	*Secamone afzelii*	Asclepidiaceae	Shrub	WP	Cough/Catarrh	4	0.01	4	0.17	5.00	8.33
145	*Securidaca longipedunculata*	Polygalaceae	Tree	R, SB	Diarrhoea/Cataract/Aphrodisiac	14	0.05	9	0.50	15.00	25.00
146	*Securinega virosa*	Euphorbiaceae	Shrub	R	Diarrhoea	9	0.03	7	0.33	10.00	16.67
147	*Senecio biafrae*	Asteraceae	Herb	L	Wounds	4	0.01	4	0.17	5.00	8.33
148	*Senna alata*	Fabaceae	Shrub	L, S	Dysentery/Skin Diseases	9	0.03	7	0.33	10.00	16.67
149	*Senna obtusifolia*	Fabaceae	Shrub	L, R	Diarrhoea	4	0.01	4	0.17	5.00	8.33
150	*Senna occidentalis*	Fabaceae	Herb	L, F	Convulsion/HBP	4	0.01	4	0.17	5.00	8.33
151	*Senna podocarpa*	Fabaceae	Shrub	L, R	Venereal Diseases	4	0.01	4	0.17	5.00	8.33
152	*Sida acuta*	Malvaceae	Herb	L, R	Malaria/Boil/Urinary Disorder	9	0.03	7	0.33	10.00	16.67
153	*Sida cordifolia*	Malvaceae	Herb	L, R	Asthma/Rheumatism	4	0.01	4	0.17	5.00	8.33
154	*Solanum nigrum*	Solanaceae	Herb	WP	Convulsion/Heart Disease	4	0.01	4	0.17	5.00	8.33
155	*Solanum torvum*	Solanaceae	Shrub	F, R	Cough/Liver Problem	4	0.01	4	0.17	5.00	8.33
156	*Sorghum bicolor*	Poaceae	Herb	WP	Malaria	4	0.01	4	0.17	5.00	8.33
157	*Sphenocentrum jollyanum*	Menispermaceae	Shrub	R, F	Diarrhoea	4	0.01	4	0.17	5.00	8.33

158	*Stachytarpheta indica*	Verbenaceae	Shrub	L	Gonorrhea	4	0.01	4	0.17	5.00	8.33
159	*Sterculia tragacantha*	Sterculiaceae	Shrub	L, R	Whitlow/Malaria	4	0.01	4	0.17	5.00	8.33
160	*Tabernaemontana pachysiphon*	Apocynaceae	Shrub	L, SB	Syphilis/Leprosy	4	0.01	4	0.17	5.00	8.33
161	*Talinum triangulare*	Portulacaceae	Herb	WP	Gonorrhea	9	0.03	7	0.33	10.00	16.67
162	*Tamarindus indica*	Fabaceae	Tree	L, F, SB	Diarrhoea/Inflammation	4	0.01	4	0.17	5.00	8.33
163	*Telfaria occidentalis*	Cucurbitaceae	Vine	L	Blood Shortage	19	0.06	12	0.67	20.00	33.33
164	*Terminalia ivorensis*	Combretaceae	Tree	L, SB	Diarrhoea	4	0.01	4	0.17	5.00	8.33
165	*Terminalia superba*	Combretaceae	Tree	R, SB	Constipation	4	0.01	4	0.17	5.00	8.33
166	*Tetrapleura tetraptera*	Fabaceae	Tree	R, F	Arthritis/Flatulence	4	0.01	4	0.17	5.00	8.33
167	*Treculia africana*	Moraceae	Tree	SB, R	Anaemia/Venereal Diseases	9	0.03	7	0.33	10.00	16.67
168	*Tribulus terrestris*	Zygophyllaceae	Herb	WP	Impotence/Gonorrhea	4	0.01	4	0.17	5.00	8.33
169	*Trichilia emetic*	Meliaceae	Tree	L, R	Gonorrhea/Diarrhoea	9	0.03	7	0.33	10.00	16.67
170	*Triumfetta cordifolia*	Tiliaceae	Shrub	L, F	Malaria	14	0.05	9	0.50	15.00	25.00
171	*Uvaria chamae*	Annonaceae	Shrub	L, R	Diarrhoea	9	0.03	7	0.33	10.00	16.67
172	*Vernonia amygdalina*	Asteraceae	Shrub	L	Diarrhoea/Malaria	39	0.13	22	1.33	40.00	66.67
173	*Vernonia cinerea*	Asteraceae	Herb	L	Cough/Dysentery	4	0.01	4	0.17	5.00	8.33
174	*Vernonia colorata*	Asteraceae	Shrub	L, R	Skin Diseases	14	0.05	9	0.50	15.00	25.00
175	*Vigna unguiculata*	Fabaceae	Herb	S	Boil/Weight Loss	4	0.01	4	0.17	5.00	8.33
176	*Xylopia aethiopica*	Annonaceae	Tree	L, F, SB	Stomach Disorder	24	0.08	14	0.83	25.00	41.67
177	*Zea mays*	Poaceae	Herb	Inf	Urinary Infections	9	0.03	7	0.33	10.00	16.67
178	*Zingiber officinale*	Zingiberaceae	Herb	Rh	Typhoid/Fever/Asthma	4	0.01	4	0.17	5.00	8.33
179	*Ziziphus mucronata*	Rhamnaceae	Tree	F	Diarrhoea	4	0.01	4	0.17	5.00	8.33

L=Leaf, SB = Stem Bark, R = Root, F = Fruit, Bu = Bulb, Tu = Tuber, Rh = Rhizome, Inf = Inflorescence, S = Stem, Tw = Twig, WP = Whole Plant

Table 3: Number of species used according to medical indications

S/N	Indication	Number of species	Percentage
1	Abdominal pain	3	1.67
2	Abortifacient	1	0.56
3	Anaemia	1	0.56
4	Arthritis	1	0.56
5	Asthma	10	5.56
6	Blood shortage	2	1.11
7	Boil	3	1.67
8	Cataract	2	1.11
9	Chest Pain	4	2.22
10	Constipation	4	2.22
11	Convulsion	2	1.11
12	Cough	10	5.56
13	Diabetes	7	3.89
14	Diarrhoea	16	8.89
15	Dysentery	5	2.78
16	Earache	1	0.56
17	Fatigue	2	1.11
18	Fever	2	1.11
19	Gonorrhea	10	5.56
20	Gynecological diseases	1	0.56

Table 3 Cont'd

21	Heart disease	1	0.56
22	Headache	1	0.56
23	Hepatitis	5	2.78
24	High blood pressure	3	1.67
25	Impotence	2	1.11
26	Infertility	7	3.89
27	Inflammation	2	1.11
28	Jaundice	1	0.56
29	Labour pain	1	0.56
30	Liver problem	1	0.56
31	Loss of Appetite	1	0.56
32	Low sperm count	1	0.56
33	Malaria	10	5.56
34	Menstrual disorder	1	0.56
35	Mental disorder	1	0.56
36	Miscarriage	4	2.22
37	Nausea	1	0.56
38	Ocular diseases	1	0.56
39	Oral infections	2	1.11
40	Poison	1	0.56
41	Rheumatism	5	2.78
42	Skin diseases	9	5.00
43	Snakebite	1	0.56
44	Spleen infection	1	0.56
45	Stomach disorder	6	3.33
46	Sores	1	0.56
47	Tuberculosis	1	0.56
48	Typhoid	1	0.56
49	Ulcer	2	1.11
50	Urinary infections	7	3.89
51	Venereal diseases	3	1.67
52	Weight loss	1	0.56
53	Whitlow	2	1.11
54	Wounds	5	2.78

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Table 4: Family Importance Value (FIV) of the medicinal plants recorded during the survey

S/N	Family	Number of Species	FC	FIV (%)
1	Acanthaceae	2	23	1.52
2	Amanranthaceae	1	14	0.93
3	Amaryllidaceae	1	4	0.26
4	Anacardiaceae	1	34	2.25
5	Annonaceae	7	53	3.51
6	Apocynaceae	7	83	5.49
7	Araceae	2	8	0.53
8	Aristolacaceae	1	4	0.26
9	Asclepidiaceae	1	12	0.79
10	Asparagaceae	1	4	0.26
11	Asteraceae	10	150	9.92
12	Bignoniaceae	3	17	1.12
13	Bixaceae	1	4	0.26
14	Burseraceae	1	4	0.26
15	Cannaceae	1	4	0.26
16	Caricaceae	1	29	1.92
17	Celastraceae	1	4	0.26
18	Chrysobalanaceae	1	4	0.26
19	Clusiaceae	1	39	2.58
20	Combretaceae	1	20	1.32
21	Connaraceae	1	4	0.26
22	Convolvulaceae	1	4	0.26
23	Costaceae	1	4	0.26
24	Crassulaceae	2	13	0.86
25	Cucurbitaceae	8	66	4.37
26	Cyperaceae	1	4	0.26
27	Dichapetalaceae	1	4	0.26
28	Dioscoreaceae	2	4	0.26
29	Euphorbiaceae	8	72	4.76
30	Fabaceae	29	166	10.98
31	Hypericaceae	1	14	0.93
32	Hypoxidaceae	1	4	0.26
33	Icacinaceae	1	4	0.26
34	Irvingiaceae	1	4	0.26
35	Lamiaceae	4	16	1.06
36	Lauraceae	1	4	0.26
37	Malvaceae	6	50	3.31

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Table 4 Cont'd.

38	Meliaceae	4	66	4.37
39	Menispermaceae	1	4	0.26
40	Moraceae	5	30	1.98
41	Moringaceae	1	14	0.93
42	Musaceae	1	4	0.26
43	Myrtaceae	1	29	1.92
44	Nyctaginaceae	2	48	3.17
45	Pandaceae	1	4	0.26
46	Periplocaceae	1	4	0.26
47	Petiveriaceae	1	4	0.26
48	Phyllanthaceae	3	12	0.79
49	Piperaceae	2	18	1.19
50	Plantaginaceae	1	4	0.26
51	Plumbaginaceae	1	4	0.26
52	Poaceae	6	44	2.91
53	Polygalaceae	2	18	1.19
54	Portulacaceae	1	9	0.60
55	Rhamnaceae	1	4	0.26
56	Rubiaceae	6	39	2.58
57	Rutaceae	4	86	5.69
58	Sapindaceae	2	8	0.53
59	Sapotaceae	1	4	0.26
60	Solanaceae	6	29	1.92
61	Sterculiaceae	1	4	0.26
62	Tiliaceae	2	18	1.19
63	Verbenaceae	3	32	2.12
64	Vitaceae	1	9	0.60
65	Zingiberaceae	2	8	0.53
66	Zygophyllaceae	1	4	0.26

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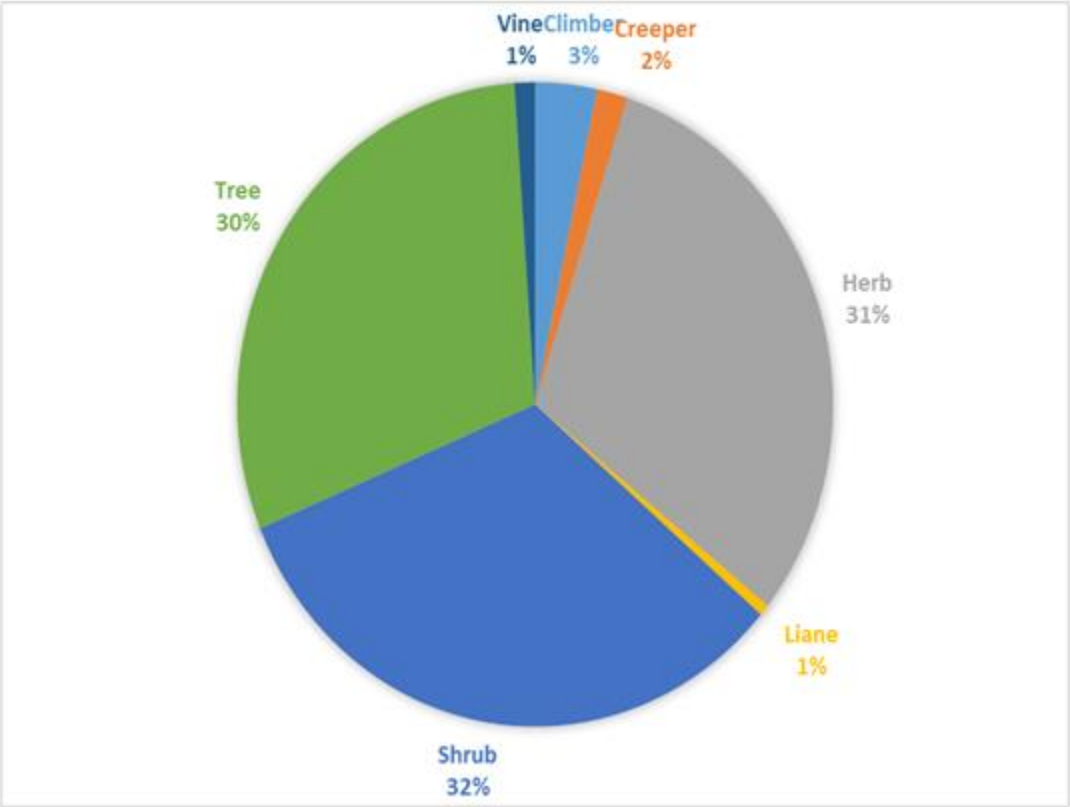

Fig. 2: Proportion of various plant life forms used in medicinal preparations in some communities in Ondo State

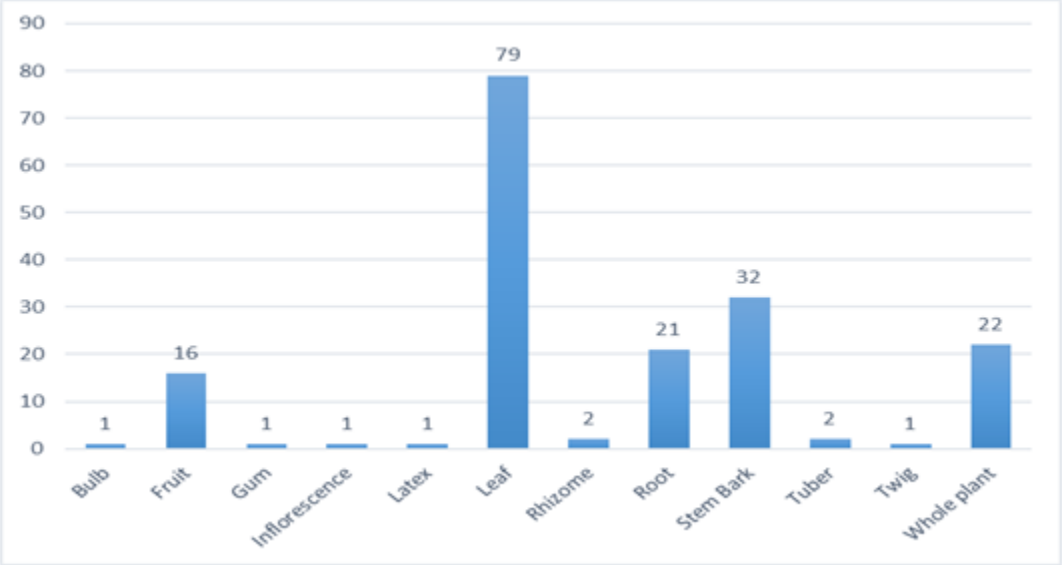

Fig. 3: Frequencies of the various plant parts used in medicinal preparations in some communities in Ondo State

DISCUSSION

The number of medicinal plant species used in the study communities showed that the study areas are rich in floristic composition and that the informants utilize medicinal plants as part of their medical protocols. Similar observations have been reported in other studies that focused on the use of plants by people in rural and semi-urban parts of the world (Zizka *et al.,* 2015). As earlier stated, only complete and cross-examined plant information were included in the analysis. Majority of the information that fell short of these criteria were supplied by younger participants. Older informants (ages 30 – 40) were more cooperative and gave complete information on the plant medicinal uses. This finding corroborated the report of Rehman *et al.* (2022) that the use and knowledge of medicinal plants are more prevalent among elders. Similarly, male informants seem to be more knowledgeable than their female counterparts while farmers, hunters and artisans gave more information than other categories of informants. Worldwide, traditional medical practitioners, farmers, hunters, midwives, herb sellers etc. are known to be vast in the application of plants as herbal remedies (Bhat *et al.,* 1990; Erinoso and Aworinde, 2012).

In general, herbaceous plants are more frequently used in herbal preparations. In this study, however, shrubs featured more than the other plant forms in the prescriptions. The use of herbs is most common when the preparations involve the use of the whole herbaceous plant(s). In any case, the useful plant part is the most important. For example, stem bark and twig are essentially obtained from shrubs and trees whereas leaves could be obtained from herbaceous plants, shrubs or trees. Leaves formed the most commonly used plant part and this has also been reported in earlier studies on plant-human interactions (Erinoso and Aworinde, 2012; Zizka *et al.,* 2015). The advantages of using leaves as part of medical preparations are that removal of leaves cause minimal harm to the plant and the rate of recovery is higher and faster compared to when the stem bark or roots are harvested.

High values of FC, RFC, UR, UV, CI, FL recorded for the medicinal plants in this study show that the plants are important medical resources for the communities. Greater use values will result from higher use reports; consequently, the consensus index and fidelity level will also be high. While the CI indicates the level of agreement between different informants on a particular plant, the FL shows that the plant is in high use by the informants. This concept further confirms the importance of cross-cultural comparison of medicinal plant use. Although, *Azadiractha indica* (family Meliaceae) was the most cited plant, the family Fabaceae had the highest Family Importance Value (FIV). The implication of this is that plants cited in the family Fabaceae were more commonly used for treating different disorders in the communities based on the frequency of citations of these plants. It is worthy of note that irrespective of the number of cited species in a family, the frequency of citation of all the species determines the greatness of the family importance value.

Previous research reports, within and outside Nigeria, have highlighted the antimalarial values of *Azadirachta indica* (Iwu *et al.,* 1986; Bhat *et al.,* 1990; Aiyeloja and Bello, 2006; Ehiagbonare, 2007) and *Vernonia amygdalina* (Bhat *et al.,* 1990; Asase *et al.,* 2005), anti-pyretic value of *Lantana camara* (Lagnika *et al.,* 2016), use of *Senna alata* (=*Cassia alata*) in the treatment of skin diseases/ringworm (Bhat *et al.,* 1990), *Sida cordifolia* in the management of asthma (Bhat *et al.,* 1990), *Ocimium gratissimum* as anti-diarrhoea/stomach upset (Aiyeloja and Bello, 2006), *Bridelia micrantha* (a relative of *Bridelia ferruginea*), *Momordica charantia* and *Phyllantus amarus* in the treatment of diabetes (Abo *et al.,* 2008; Laleye *et al.,* 2015), *Clausena anisata* in the treatment of stomach pain or abdominal disorder (Olajuyigbe and Afolayan, 2012) etc. Other plants mentioned in this study have also been known and reported to be useful in the management of diseases or disorders that are more or less related to the indications stated in this study. This means that the plants have broad spectrum values.

Conclusion

This article presents the first quantitative report of medicinal uses of plants in some communities in Ondo State. This study further confirmed that plants are important resources in the communities and formed part of the people's day-to-day life, and interaction with the natural environment. Although shrubs were the most cited plant forms, leaves were the most commonly used plant parts. The FC, RFC, UR, UV, CI and FL of *Azadirachta indica, Ageratum conyzoides, Garcinia kola, Mangifera indica* and others in the top 10 category showed that the medicinal plants are very useful in the communities and the informants independently apply the plants for same or allied treatment of ailments. Diarrhoea, malaria, cough, asthma, gonorrhea, skin diseases, and stomach disorder were the ailments stated by the informants to be frequently treated. Although these conditions are not life-threatening, it is necessary and important for the government to sensitize the communities on disease prevention and control. Many plant species that are disappearing and becoming scarce and difficult to access need to be micro-propagated and conserved in medicinal plants gardens for reference and utilization purposes. There is need to properly educate plant users in the communities on the sustainable use of plant resources.

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REFERENCES

Abo, K.A., Adeyemi, A.A. and Dosunmu, A. (2000). Ethnobotanical survey of plants used in the treatment of infertility and sexually transmitted diseases in Southwest Nigeria. *African Journal of Medicine and Medical Sciences,* 29: 325-327.

Abo, K.A., Fred-Jayeisimi, A.A. and Jayeisimi, A.E.A. (2008). Ethnobotanical studies of medicinal plants used in the management of diabetes mellitus in south western Nigeria. *Journal of Pharmacology,* 115: 67-71.

Adjanohoun, E., Ahyi, M.R.A., Ake-Assi, L., Elewude, J.A., Dramane, K., Fadoju, S.O., Gbile, Z.O., Goudole, E., Johnson, C.L.A., Keita, A., Morakinyo, O., Ojewole, J.A.O., Olatunji, A.O. and Sofowora, E.A. (1991). *Traditional Medicine and Pharmacopoeia: Contribution to Ethnobotanical Floristic Studies in Western Nigeria.* Published by the Organization of African Unity, Scientific, Technical, and Research Commission, Lagos, Nigeria.

Aiyeloja, A.A. and Bello, O.A. (2006). Ethnobotanical potentials of common herbs in Nigeria: a case study of Enugu state. *Educational Research and Reviews,* 1(1): 18-22.

Akobundu, I.O. and Agyakwa, C.W. (1998). *A Handbook of West Africa Weeds* (2nd Edition). International Institute of Tropical Agriculture, Ibadan, Nigeria.

Albuquerque, U.P. (2009). Quantitative Ethnobotany or Quantification in Ethnobotany? *Ethnobotany Research and Applications,* 7: 001-003.

Asase, A., Oteng-Yeboah, A.A., Odamtten, G.T. and Simmonds, M.S.J. (2005). Ethnobotanical study of some Ghanaian anti-malarial plants. *Journal of Ethnopharmacology,* 99: 273-279.

Bhat, R.B., Etejere, E.O. and Oladipo, V.T. (1990). Ethnobotanical studies from central Nigeria. *Economic Botany,* 44(3): 382-390.

Bussmann, R.W. (2006). Ethnobotany of the Samburu of Mt. Nyiru, South Turkana, Kenya. *Journal of Ethnobiology and Ethnomedicine*, 2(35): 1-10.

Byg, A. and Balslev, H. (2001). Traditional knowledge of *Dypsis fibrosa* (Arecaceae) in eastern Madagascar. *Economic Botany,* 55: 263-275.

Ehiagbonare, J.E. (2007). Vegetative propagation on some key malaria medicinal plants in Nigeria. *Scientific Research and Essay,* 2: 37-39.

Erinoso, S.M. and Aworinde, D.O. (2012). Ethnobotanical survey of some medicinal plants used in traditional health care in Abeokuta areas of Ogun State, Nigeria. *African Journal of Pharmacy and Pharmacology,* 6(18): 1352-1362.

Falodun, K. (2017). Geography of Ondo State. Available at https://www.propertyprong/blog/geography-of-ondo-state/. Accessed and retrieved on 19/10/2021.

Gomez-Beloz, A. (2002). Plant use knowledge of the Winikina Warao: The case for questionnaires in ethnobotany. *Economic Botany,* 56(3): 231-241.

Hoffman, B. and Gallaher, T. (2007). Importance indices in ethnobotany. *Ethnobotany Research and Applications,* 5: 201-218.

Hoft, M., Barik, S.K. and Lykke, A.M. (1999). *Quantitative Ethnobotany: Applications of Multivariate and Statistical Analyses in Ethnobotany*. People and Plants Working Paper 6. UNESCO, Paris.

Hutchinson, J. and Dalziel, M. (1958). *Flora of West Tropical Africa*. Part 1. Revised by Keay, R.W.J. Crown Agents, London. Vols. 1 and 2. 600-611.

Iwu, M.M., Obidoa, O. and Anazodo, M. (1986). Biochemical mechanism of the antimalarial activity of *Azadirachta indica* leaf extract. *Pharmacological Research Communications,* 18: 81-91.

Keay, R.W.J., Onochie, C.F.A. and Stanfield D.P. (1964). *Nigerian Trees*. Department of Forest Research, Ibadan, Nigeria.

Lagnika, L., Djehoue, R., Yedomonhan, H. and Sanni, A. (2016). Ethnobotanical survey of medicinal plants used in malaria management in South Benin. *Journal of Medicinal Plants Research,*10(41): 748-756.

Laleye, F.O.A., Mensah, S., Assogbadjo, A.E. and Ahissou, H. (2015). Diversity, knowledge, and use of plants in traditional treatment of diabetes in the Republic of Benin. *Ethnobotany Research and Applications,* 14: 231-257.

Moermann, D. (1989). Poisoned apples and honey suckers: The medicinal plants of native America. *Medical Anthropology Quarterly,* 3: 52-61.

Olajuyigbe. O.O. and Afolayan, A.J. (2012). Ethnobotanical survey of medicinal plants used in the treatment of gastrointestinal disorders in the eastern Cape Province, South Africa. *Journal of Medicinal Plants Research,* 6(18): 3415-3424.

Phillips, O. and Gentry, A.H. (1993a). The useful plants of Tambopata, Peru: I. Statistical hypotheses tests with a new quantitative technique. *Economic Botany,* 47(1): 15-32.

Phillips, O. and Gentry, A.H. (1993b). The useful plants of Tambopata, Peru: II. Additional hypothesis testing in quantitative ethnobotany. *Economic Botany.* 47(1): 33-43.

Phillips, O., Gentry, A.H., Reynel, C., Wilkin, P. and Galvez-Durand, C. (1994). Quantitative ethnobotany and Amazonian conservation. *Conservation Biology,* 8(1): 225-248.

Prance, G.T., Balee, W. and Boom, B.M. (1987). Quantitative ethnobotany and the case for conservation in Amazonia. *Conservation Biology,* 1(4): 296-310.

Rehman, S., Iqbal, Z., Qureshi, R., Rahman, I.U., Khan, M.A., Elshaer, M.M.A., Al Farraj, D.A., Elshikh, M.S., Younas, M., Sakhi, S., Nawaz, G., Ali, N., Rahim, F., Ali, H., Khan, I., Rahman, S.U., and Abu-Bakr-Elsaid, N.M. (2022). Ethnogynaecological knowledge of traditional medicinal plants used by indigenous communities of North Waziristan, Pakistan. Evidence-Based Complementary and Alternative Medicine, 1-22.

World Health Organization (WHO) (1978). *The Promotion and Development of Traditional Medicine: A Report of WHO Meeting*. World Health Organization Technical Report, Series 622, Geneva, Switzerland.

Zizka, A., Thiombiano, A., Dressler, S., Nacoulma, B., Ouedraogo, A., Oedraogo, I., Ouedrago, O., Zizka, G., Hahn, K. and Schmidt, M. (2015). Traditional plant use in Burkina Faso (West Africa): a national-scale analysis with focus on traditional medicine. *Journal of Ethnobiology and Ethnomedicine,* 119: 1-10.