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ETHNO-BOTANICAL SURVEY OF INDIGENOUS MEDICINAL PLANTS IN AGROFORESTRY FARM OF FOREST RESEARCH INSTITUTE OF NIGERIA, IBADAN, OYO STATE, NIGERIA

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ABSTRACT

Ethno-botanical survey of indigenous medicinal plants was conducted in Agroforestry farms of Forestry Research institute of Nigeria Arboretum, Ibadan, Oyo State. A structured questionnaire was used. A total of 50 questionnaires were administered to farmers engaging in agroforestry as a method of farming through face to face interview method. Local names of plants mentioned by respondents were documented and their scientific names traced using Floral of West Africa text book. The utilizations of these plants and ailments they treat mentioned by the respondents were recorded. The data collected were presented in percentages and frequencies. The results showed that respondents are more of males (64%) than females (36%). Majority of farmers engaging in agroforestry were illiterates (46%) and married (72%). The total number of species found was 105 which include climbers (17), shrubs (16), trees (33) and herbs (39) were belonging to 49 families. A total number of 20 medicinal plants were found to treat and manage 24 ailments. The ailments indicated were malaria, pile, typhoid., constipation, ulcer, malaria, catarrh, high blood pressure, jaundice, ulcer, convulsion, epilepsy, diabetes, headache, insomania, low sperm count, malaria., obesity, difficult delivery, constipation., infertility, prostate enlargement, tumor ,pile, kidney stone, low immunity and haemorrhoid, measles, fibroid, wound and sore among others. It was observed that most of the plants treated more than 1 ailment except Commelina africana, Alchornea laxiflora, Newbouldia laevis and Tithonia diversifolia. Vegetative parts of medicinal plants used include leaves, bark and roots account for plant materials used in the preparation for treating ailments.

Keywords: Medicinal, Ailment, Questionnaire, Arboretum, biodiversity, conservation

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INTRODUCTION

In history, plants have been part of human life. Aside the primary functions like food and shelter, humans have sought for herbal remedy in plants to treat various ailments (WHO, 2002). Traditional medicine history has it that different plant species were used between 5000 and 4000 BC in China, and 1600 BC by Syrians, Babylonians, Hebrews and Egyptians (Dery *et al*., 1999). The indigenous knowledge from the early men is connected with the trado-medicine in different countries (Farnsworth, 1994). Approximately 80% of the world's population depends on trado-medicine to take care of their health needs (WHO, 2002, David, 2010 and Muthu *et al*., 2006). Sofowora (1996) reported

that about 60 – 85% of every developing country population depends on trado-medicine. Africa has history of the use of plants for therapeutic purposes and 90 % of African population depends on medicinal plants as raw materials for drugs manufacturing industries (Hostettmann *et al*., 2000).

Plants are dependable means of treating diseases in most parts of the globe (Hostettmann *et al*., 2000). Trado-medicine largely depends on the use of herbs. World Health Organization (WHO) in its policy document therefore recognized this practice in 1977 and sustained that "a medicinal plant" is a plant, which contains substances that is useful for the medicinal purposes in one or more of its organs or which are precursors for the manufacture of useful drugs (WHO, 1991). A medicinal plant is a plant has active substances which can be used for medicinal purposes or contains compounds that are used in manufacturing useful drugs in its organs (Sofowora, 1993).

Medicinal plants contain active ingredients used to treat diseases or relieve pains (Okigbo and Mmeka, 2006). The use of medicinal plants in most developing countries as medicinal agents for the sustenance of good health has been widely accepted. Medicinal plants are collected from forest and sold in market places (Von Maydell, 1996). The Nigerian flora has potential as a viable source for pharmaceuticals and other medicinal materials as documented. Herbal plants constitute main forest resources on which the health of the average rural populace in Nigeria depends on. They are the harbor of healing materials and are known to have minimum or no side effects. Traditional medical practitioners hide the plants identity for different treatments for fear of loss of customers if they know how to treat themselves. This is why Obute and Osuji (2002) submitted that the cultivation of medicinal plants is largely discouraged by herbal practitioners in order to mystify their business, so they collect all plants used the wild. This practice is not sustainable and often results in a great loss because these practitioners die with their traditional knowledge of plants usage. Sometimes they relate this important information to a relative who has no interest in it thereby lacks continuity. Information concerning the traditional uses of indigenous plants of Africa is fast disappearing because its knowledge and uses medicinal plants is passed on verbally most times and till date there is paucity of information in literature (GuribFakim, 2006), although some written documents have been found for specific regions. It is therefore important for the research scientists to study indigenous medicinal plants in every part of the country to establish the traditional medical knowledge in Nigeria.

People in villages and remote areas primarily depend on traditional medicines as the modern system is out of reach and expensive. Many among the educated in African and Nigeria use traditional medicines for reason of firm belief that they are more effective than modern medicines for certain chronic diseases. Forests are the primary source of medicinal plants. Among the systems that requires forest development and conservation to the optimal use is agroforestry. Agroforestry is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos among others, are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. The system has contributed immensely to the conservation of medicinal plants through appropriate methods such as Taunya farming, mixed crop farming, alley farming among others. This study therefore seeks to identify the medicinal plant species present on agroforestry farm plot of Forestry Research Institute of Nigeria and potential ailments they can treat.

MATERIALS AND METHODS

Study Area

This study was carried out on Agroforestry farm plot, a part of Forestry Research Institute of Nigeria Arboretum, located at the north west direction of the longitude 07º 23' 18" N to 07º 23' 43"N and latitude 03º 51' 20" E to 03º 51'43" E about 1km away from the research headquarters and 4.5 km away from Alalubosa Forest Reserve boundary which constituted in 1916 by the colonial Administration. The rainfall pattern of the area is bimodal, with peaks around June to July and September to October. Mean annual

rainfall is about 420 mm in 109 days with mean maximum and minimum temperatures of about 34°C and 24°C respectively. Mean relative humidity ranges from about 82% between June and September, to approximately 60% between December and February (Adio *et al*. 2011, Halidu 2010).

Experimental Design

Reconnaissance and field surveys were conducted within the area of Agroforestry farm plots. Plants found around the area were identified and noted. A structured questionnaire was administered to all the fifty farmers cultivating around the area. The farmers within the study area were consulted and interviewed orally to gather information pertaining medicinal plants. These farmers were selected based on their knowledge on the use of plants for medicinal purposes.

Voucher specimens were prepared from fertile specimens that were available within the study site. Upon collection, specimens were taken to the Forest Herbarium Ibadan (FHI) for identification of botanical names. Initial identification was made through comparison with previously collected specimens deposited in the same herbarium. The Flora of West Tropical Africa (Hutchinson *et al*. 1954-1972) and Trees of Nigeria (Keay, 1989) were used in the identification of the taxa.

Data Analysis

Data collected were subjected to descriptive analysis and presented in tables.

RESULTS

Table 1 reveals the demographics status of the respondents collecting and utilizing medicinal plants from the agroforestry farm plot. The age of the respondents collecting plants from the farm ranged from 46-55years (46%), most of which were married (72%) with secondary school education (46%). They were mostly farmers (40%) while few of them were traders (26%). Both men (64%) and women (36%) made use of the medicinal plants from sampled plots.

Table 1: Demographics of Agroforestry farm plot at Forestry Research Institute of Nigeria, Ibadan

Characteristic	Frequency	%
Age status		
< 25	1	2
25-35	5	10
36-45	17	34
46-55	23	46
56-65	4	8
Total	**50**	**100**
Educational status		
No formal education	10	46
Primary	12	24
Secondary	23	20
Tertiary	5	10
Total	**50**	**100**
Gender		
Male	32	64
Female	18	36
Total	**50**	**100**

Table 2 shows the list of plants found around the area of agroforestry farm plot. The total number of species found in the area is 105 belonging to 39 families namely*;* Seventeen (17) species were abundant in the plot which are shown in the Table. The table however, indicates 17 species as climbers, 19 as shrubs, 33 as trees, grass 3 while 33 are herbs.

Table 3 shows medicinal uses of some plants in FRIN Arboretum (Agroforestry farm plots). A total number of 20 medicinal plants are used to treat and manage 27 ailments. It is observed that *Mormodica charantia* and *Ageratum conyzoides* were mostly utilized species as each was used to treat 4 ailments. Followed by *Chromolaena odorata, Spondias mombin, Azadirachta indica, Corchorus olitorius, Abelmoschus esculentus, Musa paradisiaca* and *Lantana camara* which were used to treat 3 ailments respectively. Vegetative parts of plants used included leaves bark and roots account for plant materials used in the preparation for curing these ailments.

Table 2: List of plants found in FRIN Arboretum Research Plots (Agroforestry)

S/No.	Species name	Family	Habit	Frequency
1	*Phaulopsis falcisepala* C.B.Cl.	Acanthaceae	Herb	27
2	*Asystasia gangetica* L.,		Herb	Abundant
3	*Cyathula prostrate* C. B Clark		Herb	23
4	*Alternanthera brasiliana* (L.) Kuntze	Amaranthaceae	Herb	20
5	*Althernanthera sessilis* (Jeanp.)		Herb	35
6	*Cyathul aprostrata* Linn. Blume		Herb	4
7	*Spondias mombin* L	Anacardiaceae	Tree	5
8	*Mangifera indica* L.		Tree	7
9	*Mondia whitei* (Hook. f.)Skeels		Climber	15
10	*Motandra guineensis* (Thonn)	Apocynaceae	Climber	22
11	*Holarrhena floribunda* (G.Don) T. Durand &Schinz		Tree	28
12	*Hedranthera bateri* (Hook. F.) Pichon		Herb	Abundant
13	*Elaeis guineensis*Jacq.	Arecacea	Tree	10
14	*Pargulariadaemia*Forssk. Chiov	Asclepiadaceae	Climber	19
15	*Parquetina nigrescens* (AAfz.) *Bullock*		Climber	Abundant
16	*Aspillia africana* (Pers) C.D		Herb	23
17	*Chromolaena odorata*(L) R. M. King et H. Rob.		Herb	Abundant
18	*Ageratum conyzoides*L.,	Asteracea	Herb	Abundant
19	*Melanthera scandens.* (Schumach. &Thonn.) Roberty		Herb	Abundant
20	*Tithonia diversifolia* (Hemsl.)		Shrub	Abundant
21	*Azolla filiculoides* Lam.	Azollaceae	Herb	20
22	*Newbouldia laevis* (P. Beauv) Seem	Bignoniaceae	Tree	20
23	*Ananas comosus* (L.) Merr	Bromeliaceae	Herb	17
24	*Senna alata*	Caesalpinaceae	Shrub	14
25	*Albizia zygia (DC.)J.F.Macbr*		Tree	15
26	*Carica papaya* L.	Caricaceae	Shrub	12
27	*Hippocratea indicaWilld*	Clastraceae	Climber	20
28	*Gloriosa superba* L	Colchicaceae	Herb	24
29	*Combretum paniculatum*Vent	Combretaceae	Herb	18
30	*Anogeissus leiocarpus* (DC.) Guill.		Tree	6
31	*Commelina africana* L	Commelinaceae	Herb	12
32	*Byrsocarpus coccineus* Schum. &Thonns	Connaraceae	Herb	17
33	*Cnestis ferruginea* DC		Shrub	17
34	*Bryophyllum pinnatum* (Lam.)	Crassulaceae	Herb	Abundant
35	*Telfairia occidentalis* Hook. F	Cucurbitaceae	Herb	27
36	*Mormodica charantia* L		Climber	Abundant
37	*Cyperus esculentus* L.	Cyperaceae	Grass	Abundant
38	*Dichapetallum bateri*Engl	Dichapetalaceae	Tree	10
39	*Dioscorea* spp	Dioscoreaceae	Climber	Abundant
40	*Dioscorea dumetorum* (Kunth) *Pax.*		Climber	26
41	*Diospyros monbuttensis Gurk.*	Ebeneceae	Tree	15
42	*Alchornea laxiflora*(benth) Pax& K Hoffm		Tree	15
43	Mallotusop positifolius (Geiseler) Müll.Arg	Euphorbiaceae	Tree	18
44	*Alchornea cordifolia* (Schumach. et Thonn.) Mull		Tree	20
45	*Bridellia ferruginea Benth*		Shrub	15
46	*Manioht esculenta* Crantz		Shrub	26
47	*Securinega virosa* (Roxb. ex Willd) Baill		Shrub	11
48	*Euphorbia heterophylla* L.		Herb	Abundant
49	*Margaritaria discoidea* Baill		Tree	7
50	*Cassia siemea* Lam	Fabaceae	Tree	5
51	*Anthocleistadjalonensis* A.Chev.	Gentianaceae	Tree	Abundant
52	*Icacina trichantha* Olive	Icacinaceae	Herb	19

S/No.	Species name	Family	Habit	Frequency
53	*Calopogonium mucunoides*Desv	Leguminosae	Climber	24
54	*Pterocarpus osun*		Tree	3
55	*Albizia ferruginea* (Guill. &Perr.) Benth		Tree	6
56	*Anthocleist adjalonensis* A. Chev	Loganiaceae	Tree	16
57	*Spigelia anthelmia* Linn.		Herb	23
58	*Lagerstroemia speciosa* L	Lythraceae	Tree	25
59	*Corchorus olitorius* L.	Malvaceae	Herb	23
60	*Urenalo bata* L		Herb	13
61	*Abelmoschus esculentus* L		Shrub	15
62	*Chassalia kolly* (Schumach.) Hepper	Meliaceae	Herb	16
63	*Triclisiasub cordata Oliv*	Menispermaceae	Herb	16
64	*Sphenocentrum jollyanum* Pierre		Shrub	18
65	*Triclisiasub cordata* Oliv		Herb	24
66	*Synclisias cabrida* Miers		Climber	9
67	*Albizzia lebbeck* (L) Benth	Mimosaceae	Tree	15
68	*Leucanea leucocephala* (Lam.) de Wit		Shrub	25
69	*Ficusmocuso*Welw. Ex Ficalho	Moraceae	Tree	14
70	*Ficussur*s		Tree	11
71	*Ficus exasperate* Vhal		Tree	10
72	*Azadirachtaindica*		Tree	5
73	*Antiaris asfricana* Lesch		Tree	9
74	*Meliciaexcelsa*(Welw C.C. Berg)		Tree	11
75	*Musa paradisiacal* L.	Musaceae	Shrub	16
76	*Musa acuminate* Colla		Shrub	7
77	*Psidiumguajava*s	Myrtaceae	Tree	14
78	*Gliricidiasepium* (Jacq.) Walp.	Papilionaceae	Tree	21
79	*Desmodiumvelutinum* (Willd) DC		Herb	13
80	*Centrosemaplumeri* (Turpin) Benth		Shrub	15
81	*Adenialobata*(Jacq.)Engl.	Passifloraceae	Climber	17
82	*Passiflorasfoetida*L		Climber	30
83	*Adeniacis sampeloides.* (Planch. ex Hook.) Harms		Climber	20
84	*Bambusa vulgaris* Schrad ex J.C. *Wendl*	Poaceae	Shrub	Abundant
85	*Pennisetum purpureum* Schumach		Grass	23
86	*Oplismenushirtellus* L. P. Beauv		Grass	35
87	*Carpolobialutea* G. Don	Polygalaceae	Shrub	17
88	*Psychotriabrassii*Hiem	Rubiaceae	Herb	25
89	*Morinda lucida Benth*		Shrub	20
90	*Macrosphyra longistyla* (DC) Hook.f.		Shrub	15
91	*Borreriascabra* (Schum. &Thonn.) K. Schum		Herb	17
92	*Lecaniodiscuscupanioides* Planch	Sapindaceae	Tree	15
93	*Paullinia pinnata* L		Climber	Abundant
94	*Deinbollia pinnata* (Poir.) Schumach. &Thonn.		Shrub	20
95	*Allophyllus africanus* P. Beauv. f.		Tree	Abundant
96	*Smilax krausianna*Meisn.	Smilacaceae	Climber	7
97	*Cola gigantean* A Chev–	Sterculiaceae	Tree	4
98	*Glypha barteri* L.	Tiliaceae	Herb	18
99	*Triumfetta cordifolia A. Rich.*		Herb	19
100	*Gmelina arborea Juss*	Verbanaceae	Tree	20
101	*Stachytarphetacayennensis* (Rich.) Schau.		Shrub	Abundant
102	*Lantana camara* L.		Herb	20
103	*Tectona grandis* L.		Tree	10
104	*Cissus arguta* Hook	Vitaceae	Climber	20
105	*Cissusaralioides* (Welw.) Planch		Climber	8

Table 3: Some Medicinal uses of some plants in FRIN Arboretum (Agroforestry farm plots)

S/No.	Species	Local name (Yoruba)	Ailments	No. of ailments Species treats	Administration/Recipe
1	*Tithonia diversifolia*	Sepeleba	Malaria	0	Leaves are boiled and drunk. 1 shot is taken 3 times daily.
2	*Anogeissus leiocarpus*	Ayin	High blood pressure	1	Decoction of the leaves is drunk. 1 full cup is taken thrice daily
3	*Cassia siemea*	Kasia	Pile, Typhoid	2	The roots of the plants are soaked in seven up for drinking. 1 shot 3 times daily
4	*Ageratum conyzoides*	Imi esu	Constipation, ulcer, malaria, catarrh	4	Juices extracted from leaves are drunk 2 times daily.
5	*Lantana camara*	Ewon agogo	High blood pressure, jaundice, ulcer.	3	Leaves are boiled and drunk with 1 cup thrice daily for 2 weeks.
6	*Musa paradisiaca*	Ogede agbagba	Ulcer, convulsion, epilepsy	3	The peels are dried and grounded into powder form. 1 teaspoon are taken thrice daily.
7	*Abelmoschus esculentus*	Ila	Diabetes, headache	3	The fruits are soaked in water overnight for 1 day. 1 shot is taken 3 times daily.
8	*Passifloras foetida*		High blood pressure, insomnia	2	Boiling of the whole leaves is drunk. 1 cup is taken 3 times daily.
9	*Psidium guajava*	Gurofa	Low sperm count, malaria	2	A cup of juice extracted from the leaves is drunk with carrot for 2 months.
10	*Corchorus olitorius*	Ewedu	Obesity, difficult delivery, constipation	3	The juices of the leaves are drunk 3 times daily for 1month (obesity) and 3 days for difficult delivery.
11	*Newbouldia laevis*	Akoko	Infertility	1	Infusion of the leaves, stem bark is drunk. 1 shot is taken 2 times daily for 10 days.
12	*Byrsocarpus coccineus*	orioterin	Prostate enlargement, tumor	2	Fermentation of leaves with palm wine is drunk. 1 cup is taken 3 times daily till symptoms disappear.
13	*Mormodica charantia*	Ejinrin	Pile, kidney stone, low immunity and hemorrhoid	4	The leave extracts with salt are a combined for drinking. 1 table spoon is taken 2 times daily for 3 days.
14	*Azadirachta indica*	Dongoyaro	Malaria, measles, typhoid	3	Decoction of the leaves is drunk. 1 shot is taken 3 times daily for 5 days
15	*Spondias mombin*	Iyeye	Fibroid, pile, prostate enlargement	3	The fruits, leaves are boiled together. 2 cups is taken 2 times daily.
16	*Alchornea laxiflora*	Ijan	Malaria	1	Decoction of the leaves is drunk. 1 cup is taken 3 times daily till the symptoms disappear.
17	*Calopogonium mucunoides*		Ulcer, wound and sore	3	Leaves are boiled with *Bidens pilosa* and *Croton lobatus*. 1 cup is taken 2 times daily for 5 days
18	*Aspillia africana*	Yunriyun	Dysentery, ulcer	2	Leaves are grounded into powder. 1 teaspoon is taken daily for 2 days.
19	*Chromolaena odorata*	Akintola	Malaria, typhoid and sores	3	Leave are boiled with *Morinda lucida* plants and drunk. 1 shot is taken 3 times daily for 5 days.
20	*Commelina africana*	Itopere	Ulcer	1	The whole plants are boiled for drinking. 1 shot is taken 2 times daily

DISCUSSION

Table 1 Moreover, the age groups involved were working class people who had a lot of dependents they cater for. They were also an experienced people who have been familiar with the uses of a plant species or the other. This is in agreement with Otegbeye and Famuyide (2005) who reported that agroforestry practice had created employment among youths through the sale of agroforestry products both at village level and in the cities where middle- men came from. This finding concurs with FAO (1990) who reported that plants provide food, medicine, raw materials and income for forest dwellers. It is deduced that majority of the agroforestry farming participants are illiterates, engaging in farming activities as profession that would provide for their households needs at the same time requires no education. This is supported by Anon (2003) that products of the agroforestry to earn extra income from forest products can serve as safety net for the poor and also significant source of prosperity if it is intensively managed and produced. This implies that extension workers need to educate the farmers on adoption of agroforestry practice and other related farming system that will enhance their productivities as well as protecting economic tree species in the forest.

The result from this study showed the richness and diversity of species in the farm. The occurrence of different families is an indication that the system contains indispensable resource which satisfies a wide range of human needs varying from tangible to intangible benefits. Adekunle (2009) remarked that member of these plants has their origin in the world's tropical forests and their present use is largely rooted in traditional medicines which play a major part in maintaining the health and welfare of both rural and city dwellers in developing countries. This is reason why some of the respondents deliberately leave some plants untouched for their personal use. More so, the deliberate incorporation of trees into, or the protection of trees within an agroforestry system is an effort to enhance its short- and long-term productiveness, its economic, cultural utility and ecological stability (Otegbeye and Famuyide, 2005).

However, in table 3, leaves of these species play major roles in the preparation while reproductive part such as fruits of *Spondias mombin* and *Abelmoschus esculentus* are used in treating ailments. This corroborates with Ugbogu and Akinyemi (2004) that above 67% of vegetative parts and 8.96% of reproductive parts are used in medicinal plants. This observation is also similar to some other findings by Burkill (2000) and Adodo (2004). The medicinal preparations are mostly in liquid forms. Gbile *et al.,* (1985) reported that medicinal plants are prepared in form of liquid, powder, decoction, bathing soap, soup and majority of them are used in mixtures while few are used singly. The result corroborates with Ugbogu and Odewo (2004) who reported that forest zone of Nigeria contains numerous woody plants of medicinal importance whose products range from fruits, seeds, leaves to flowers and twigs which have formed common ingredients in a variety of traditional Nigerian drugs and dishes. Adekunle (2009) identified some plants that cured several ailments among which are malaria, abortion, cough and many others. Sofowora (1993) listed 56 medicinal plants and their essential active constituents. This is reason why Adodo (2004) reported that Nigerians, including the urban dwellers that had once rejected the efficacy of the traditional medicine, are shifting base to medicinal plants.

CONCLUSION

Agroforestry plots of Forestry Research Institute of Nigeria contained diverse medicinal plants and its diversity is indispensable to human well-being because it provides a number of remedies required in healthcare and in the provision of employment. The present study indicates that knowledge about medicinal plants does not require any formal education. The medicinal species found in the sampled plot are categorized into various habits such as climbers, shrubs, trees, grasses and herbs, and this justify the system to contain indispensable resource which satisfies a wide range of human needs. Therefore, more research still needs to be conducted on the phytochemical compositions of aforementioned species, so as to justify their consumptions.

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