

Full Length Research Paper

Medicinal plants used and the perception of plant endangerment by the traditional medicine practitioners of Nasarawa State, Nigeria: A pilot study

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The growing role of traditional medicine practice in the health care delivery system of most countries of the world cannot be over emphasized. Needless to say, more than 90% of the remedies used by the practitioners of traditional medicine are medicinal plant based. The growing demand for these plants for medicinal use and the subsequent unsustainable harvesting, livestock browsing and infrastructural development has led to the endangerment of some of the species. A pilot study was conducted to document the medicinal plants used by traditional medicine practitioners (TMPs) and those they perceived to be scarce or endangered in Nasarawa State, Nigeria. Sixty TMPs were interviewed orally with the use of structured questionnaire. A total number of 120 medicinal plant species were identified from the 158 specimens surveyed for treatment of various ailments. Forty eight percent of the respondents did not agree that wild collection of medicinal plants without replacement can increase extinction risk of such plants. Of the medicinal plants mentioned by the TMPs to be scarce, only 33 were identified taxonomically and 75% of them are trees, while 3% are herbs. The study reveals the urgent need for raising of awareness level of the TMPs on plant endangerment, training on good collection practice, sustainable collection, and as well as sensitization on sustainable biodiversity conservation practice.

Key words: Nasarawa State, medicinal plants, biodiversity conservation, Traditional Medicine Practitioners (TMPs).

INTRODUCTION

Majority of the African population regularly consults both orthodox and African traditional healing systems. WHO estimates that 60% of the people in sub-Saharan Africa use traditional medicine to alleviate their spiritual, psycho-

social and physical problems (WHO, 2001). Statistics have shown that in sub-Saharan Africa, it is estimated that one western-trained physician treats about 40,000 patients while one traditional healer treats about 400

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patients (Hogge, 1990; Mbereko and Mahlatini, 2014). This implies that there are many traditional healers serving a large portion of the population. Despite enormous advances in conventional medicines, the use of traditional medicines is encouraged, partly because some conventional drugs have failed to prove effective, have serious side effects, or cannot cure certain new illnesses (WHO, 1978; Hamayun et al., 2006; Khan et al., 2007; Sofowora, 2008; Wachtel-Galor and Benzie, 2011). The World Bank in recognition of the vital roles of medicinal plants in community sustenance and development has put up a strong case for the use of herbal in healthcare delivery. The identified vital roles include medicinal, ecological, income generation, cultural, social and religious roles (Mburu, 2005).

Today, the people that hold indigenous knowledge on the uses of plants are the older generation and the traditional healers. These traditional medicine practitioners (TMPs) at the rural community level are usually farmers, hunters, fishermen, timber workers, among others, and they are predominantly male, usually above 50 years old (Shaheen et al., 2014; Ibrahim et al., 2007). Transfer of knowledge and skills of the practice are mainly through family inheritance, and only very few practitioners developed their skill through apprenticeship. Majority of the TMPs lack formal education, however, some educated persons are developing interest in the profession. While the numbers of these TMPs are decimating mainly due to old and age death, there is relatively low knowledge turnover and practice by the younger generation that has become more mobile due to civilization (Ibrahim et al., 2007; Kunle, 2009; Kassam et al., 2011). In addition, there is rapid disappearance of genuine traditional herbalists and decline in authentic knowledge of traditional treatment (Lindsay and Hepper, 1978; Kassam et al., 2011), thus raising concerns for the extinction of indigenous traditional medicine knowledge. Furthermore, secrecy, superstition and lack of adequate records on the use of herbal medicines may have led to the loss of many invaluable heritages in herbal medicine.

Furthermore, high population pressure, which has led to high demand for medicinal plants and intensive land use for agricultural and livestock expansion, pose great danger to the very existence of our plant diversity. To preserve the traditional knowledge of plant use or our biodiversity generally, and to be able to suggest ways for their conservation, it is important to have data on medicinal plants that still exist, where to find them and their uses. Several ethnobotanical surveys have been carried out in Nigeria (Gill and Akinwunmi, 1986; Odugbemi et al., 2007; Lawal et al., 2009; Soladoye et al., 2010; Ene and Atawodi, 2012; Kunle et al., 2013). These surveys were usually focused on a community sector and addressed the documentation of the uses of medicinal plants and materials and the traditional healing practices of the rural population.

There is need, therefore, not only to carry out ethnobotanical research and documenting healing



Figure 1. Map of Nigeria showing Nasarawa State.

methods, but also to encourage propagation and conservation of herbal plants among the local people. This study aimed at undertaking a pilot study to identify, document and evaluate the local abundance of the medicinal plants used by the TMPs in Nasarawa State, North Central Nigeria.

MATERIALS AND METHODS

Study site and study population

Nasarawa State (Figure 1) lies between 8.5333° N, 8.3000° E with a land mass of 27,118 km² and located in the Savannah belt of Nigeria. It has a climate typical of the tropical zone. The population of the state as at 2006 was put at 2 million people (Report of Nigeria's National Population Commission on the 2006 Census, 2007). The state is made up of about 300 ethnic, sub-ethnic and cultural groups each with a distinct heritage. Nasarawa State has a well-organized Traditional Medicine Practitioners Association (NAMTMP) which made access to and collaboration with them for the study easy and well-coordinated. The activities of NAMTMP in the state are closely monitored by the State Ministry of Health. The people of Nasarawa State still retain most of their indigenous ways of life, including farming and traditional medicinal practice, despite the high rate of urbanization of their towns, especially those close to Federal Capital city.

Questionnaire and prior-informed consent (PIC) form

Structured questionnaire and informed consent form were designed for the study. The questionnaire included questions designed to gather data on the study area and field sites, socio-demographic characteristics of the TMPs, ethnobotanical survey of the plants used as medicines, as well as plant conservation awareness and methods used by the TMPs.

Preliminary familiarization visit, data collection and analysis

Reconnaissance visits were made to the study site, during which



Figure 2. Cross section of TMPs during Lafia interview section in Nasarawa State.

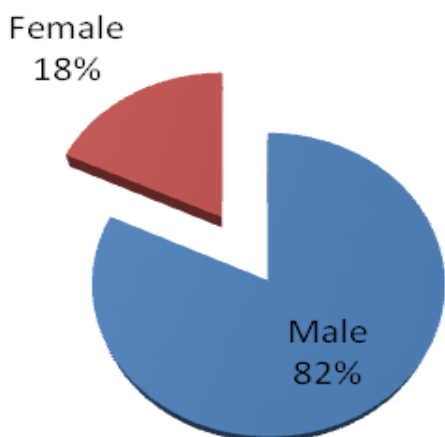


Figure 3. Sex distribution of Respondent TMPs of Nasarawa State.

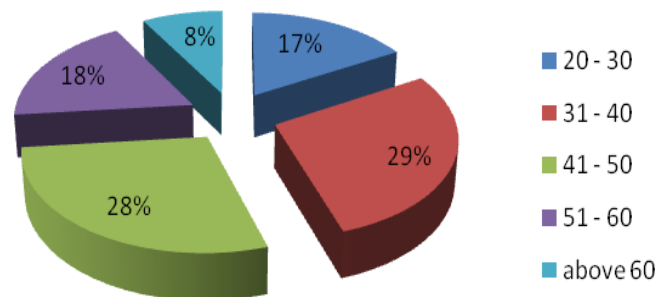


Figure 4. Age group of Respondent TMPs of Nasarawa State.

approval for the questionnaire administration was obtained from NANTMP, and 60 TMPs to be administered the questionnaires were randomly selected, including 30 TMPs each from Lafia and Keffi.

The questionnaires were administered to the selected TMPs using a focal group discussion method (Figure 2). This was done after their written consent was obtained, while the questions were explained to them with the aid of experienced interpreters to Hausa and other local languages. Collected data were analyzed using descriptive statistics such as percentages and frequency and expressed in charts.

RESULTS AND DISCUSSION

Socio-demographic characteristics of the TMPs

The socio-demographic structure of TMPs in Nasarawa State as observed in this study is similar to those reported in other parts of Nigeria and Africa. This study noted that majority of the holders of indigenous

knowledge were males and above 31 years old which corroborate with earlier findings (Ibrahim et al., 2007; Lawal et al., 2009; Shaheen et al., 2014) (Figure 3 and 4).

On the practitioners' level of education, majority of the respondents, 33% (20), had no formal education and this was always the trend in most surveys (Ibrahim et al., 2007; Shaheen et al., 2014). The 5% of the respondents observed to have post-secondary education showed that the people with high educational qualification were beginning to have interest in the practice (Figure 5).

The length of training and practice of the respondents also showed different patterns. Majority of the respondents, 39 and 25% had been practicing for over 11 years. Those that had been practicing for over 40 years were about 8% (Figure 6). Majority of the respondents (77%) did not respond to the number of years they spent training as apprentice practitioners, this might be as a result of the fact that many claimed that they inherited the practice from their parents. About 24% (17 and 7%) responded positively to training period and gave number of years spent training (Figure 7). The training or source of knowledge were also very diverse with the majority of about 82% (49) accounting for family source (Figure 8);

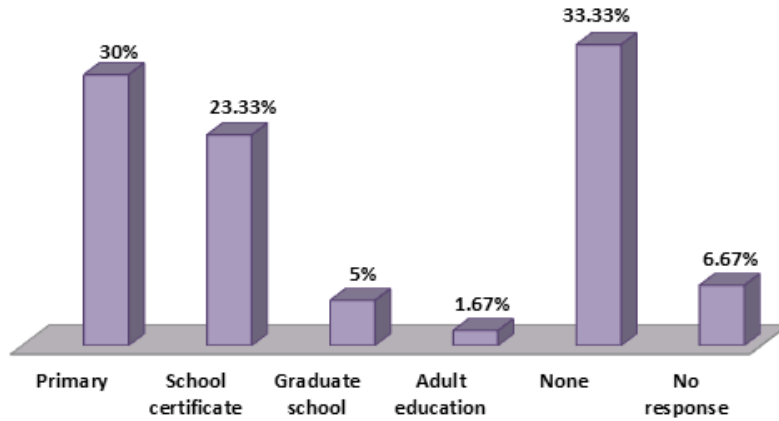


Figure 5. Level of education of Respondent TMPs of Nasarawa State.

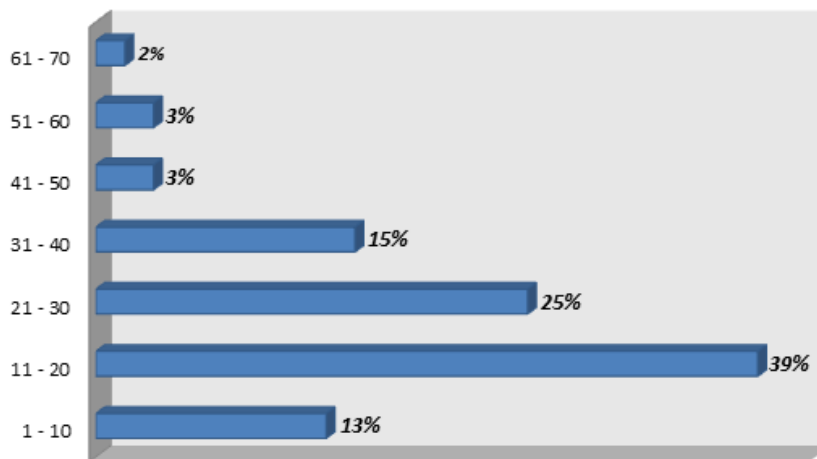


Figure 6. Length of practice by Respondents TMPs of Nasarawa State.

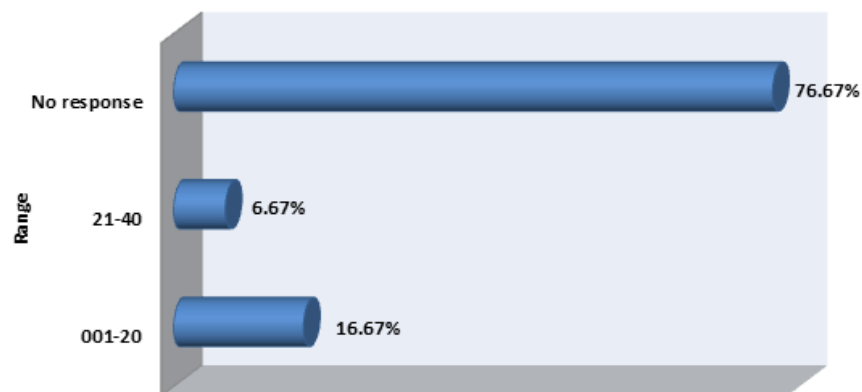


Figure 7. Years of training by the TMPs of Nasarawa State.

this correspond with most documentation or common knowledge on source of indigenous knowledge by the

locals or TMPs, which are mostly said to be inherited from the family (Ryan, 1998; Ndubani and Hojer, 1999;

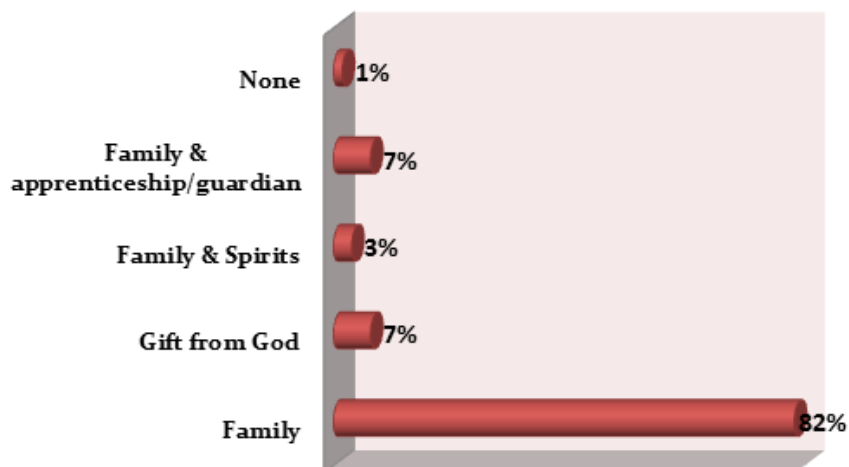


Figure 8. Source of acquiring traditional medicine knowledge by the TMPs of Nasarawa State.

Atawodi et al., 2002).

Medicinal plants used as medicines by the TMPs

A total of 158 specimens were documented comprising 120 identified species in 50 families and 38 unidentified specimens for treatments of various ailments are shown in Table 1. They were used either singly or in combination with other plants and/or additives in form of infusion, decoction, and tincture or even in powdered form. Some of the ailments treated were typhoid fever, snake bite, infertility, cancer, stomach ache, convulsion, mental illness, dysentery, pile, hypertension, measles, etc. The highest numbers of species are found in the family Fabaceae with twenty three species, followed by Euphorbiaceae and Rubiaceae each with seven species, while the least representation of one species each were found in twenty eight families (Table 1). This trend is also observed in the work of Ibrahim et al. (2010) in a study carried out in Sabo-Wuse in Niger State and Soladoye et al. (2010) where the highest number species of medicinal plants are found in the family Fabaceae. The species that were mentioned most by the TMPs for treatment of ailments is the parasitic plant of *Tapinanthus globiferus* and *Agelanthus dodoneifolius* followed by *Olax subscoipoides* (Table 1). *A. dodoneifolius* have been documented to be used for treatment of several diseases which includes hypertension, diabetes and cancer among others (Burkil, 1995; Traore, 2000; Deeni and Sadiq, 2002; Olapade, 2002).

Plant conservation awareness

The survey analysis showed about 40% of the TMPs were aware that continuous collection of plants without

replacement could increase extinction risk of the medicinal plants, while 48% did not agree that wild collection of medicinal plants can threaten them (Figure 9). Furthermore, about 42% of the TMPs have either fully developed medicinal plant garden in form of small farms, gardens or plantations or acquired land for medicinal plant cultivation, but are yet to start (Figures 10 and 11), while the high percentage of those who did not respond to the question on effort made in cultivation correspond to TMPs who believed that plants would always be in the wild and therefore did not need to propagate them. The notion by the majority of the TMPs that the plants would always be in the wild showed the level of unawareness of loss of biodiversity as it regards the rate at which plant biodiversity are being depleted. On the other hand, it might be that the plants used by some of the TMPs were still readily available in their localities. It is also possible that Nasarawa State has not experienced massive deforestation as a result of infrastructure development, thus biodiversity are yet to be adversely affected. This might not be the case in the near future due to the State's proximity to the Federal Capital Territory. It is therefore imperative to create awareness on preserving the plant biodiversity and sustainable collection of medicinal plants. The TMPs should also be trained on the different methods of conservation, especially cultivation of their medicinal plants which would also help them in quality control and assurance.

A total number of 33 plant species were reportedly cultivated by the TMPs, spread across 16 families with trees of the highest percentage (Table 1 and Figure 12). The trees cultivated by the TMPs were noted to be easily propagated and fast growing trees, such as *Moringa oleifera*, *Carica papaya* and trees that serve dual purposes as food and medicine as in *Anacardium occidentale* (Cashew), *Citrus* species (orange family), *Magnifera indica* (Mango), *Carica papaya* (Pawpaw) and

Table 1. List of medicinal plants used by TMPs of Nasarawa State for treatment of ailments.

Family	Scientific names	Local names	Plant part used	Ethnomedical uses	No. of times mentioned	Cultivated species by TMPs	Scarce medicinal plants
Amaryllidaceae	<i>Crinum spp.</i>	Gadeli	-	-	1	-	-
Anacardiaceae	<i>Anacardium occidentale</i>	Yazawa	-	-	1	Y	Sc
Anacardiaceae	<i>Heeria insignis</i>	Kekasheshe	Root/leaves	-	2	Y	-
Anacardiaceae	<i>Mangifera indica</i>	Mangoro (Hausa)	Leaves, S/bark	Constipation	2	Y	-
Anacardiaceae	<i>Sclerocarya birrea</i>	Danya	„	Various infections	1	-	-
Annonaceae	<i>Annona senegalensis</i>	Gwandandaji	Leaves, roots, S/bark	Cancer, pile	3	Y	Sc
Apocynaceae	<i>Saba florida</i>	Kuranga	Whole plant	Ring worms	1	-	-
Araceae	<i>Pistia stratiotes</i>	Kaunuwa	Whole plant	Mental illness	1	-	-
Asclepiadaceae	<i>Calotropis procera</i>	Tufafia (Hausa)	Roots	Gonorrhoea, spiritual diseases	2	-	-
Asteraceae/compositae	<i>Dicoma tomentosa</i>	Daudamaharba	-	-	1	-	-
Asteraceae/Compositae	<i>Vernonia amygdalina</i>	Bitter leaf	-	-	1	-	-
Asteraceae/Compositae	<i>Centaurea perrottetii</i>	Tsandandaji	-	Cancer	1	-	-
Bignoniaceae	<i>Kigelia africana</i>	Rahaina	-	-	1	Y	-
	<i>Adansonia digitata</i>						
Bombacaceae	<i>Bombax buonopozense</i>	Kuka (Hausa)	S/bark, leaves	Immune booster, sickle cell anaemia, constipation, ulcer	2	-	sc
	<i>Ceiba pentandra</i>						
Bombacaceae	<i>Boswellia dalzielii</i>	Gurjia; Kurya (Hausa)	Bark	Ulcer	2	-	-
Bombacaceae	<i>Commiphora africana</i>	Silk tree (English)	-	-	1	-	-
Burseraceae	<i>Boscia senegalensis</i>	Arrarabi	S/bark	Fever; internal heat	4	-	-
Burseraceae	<i>Carica papaya</i>	Dashi	Stem bark	-	2	-	-
Capparaceae	<i>Maytenus senegalensis</i>	Amza	Roots	-	1	-	-
Caricaceae	<i>Parinari spp</i>	Gwandagida	Leaves	Hypertension	1	Y	-
Celastraceae	<i>Cochlospermum sp</i>	Kurunkushiya (Hausa)	Bark	-	1	-	-
Chrysobalanaceae	<i>Anogeissus leiocarpus</i>	Rura	-	Body weakness	1	-	-
Cochlospermaceae	<i>Combretum micranthum</i>	Zunzuna	-	Convulsion	1	-	-
Combrataceae	<i>Combretum glutinosum</i>	Marke (Hausa)	Stem bark, root	-	3	-	Sc
Combretaceae	<i>Guiera senegalensis</i>	Geza (Hausa)	-	-	1	-	Sc
Combretaceae	<i>Terminalia avicennioides.</i>	Taurania	-	-	1	-	Sc
Combretaceae	<i>Bryophyllum pinnatum</i>	Sabara	Leaves	-	2	Y	Sc
Combretaceae	<i>Cucurbita maxima</i>	Baushe (Hausa)	Bark/Root/Leaves	-	2	Y	Sc
Crassulaceae	<i>Cyperus tonkinensis</i>	-	-	-	1	Y	-
Cucurbitaceae	<i>Diospyros mespiliformis</i>	Kabewa	Leaves	-	1	-	-
Cyperaceae	<i>Crinum spp.</i>	Kajiji	-	-	1	-	-
Ebenaceae	<i>Anacardium occidentale</i>	Kaiwa / Kanya	Roots	Mental illness	1	-	-

Table 1. Contd.

Euphorbiaceae	<i>Acalypha</i> spp.	-	-	-	1	Y	-
Euphorbiaceae	<i>Chrozophora senegalensis</i>	Damagi (Hausa)	Bark, whole plant	For babies	3	-	-
	<i>Hymenocardia acida</i>						
Euphorbiaceae	<i>Jatropha curcas</i>	Janyaro	Leaves, root	Infectious diseases (leaves); induce labour (root)	2	Y	Sc
	<i>Securinega virosa</i>						
Euphorbiaceae	<i>Uapaca guineensis</i>	Bini da zugu; Chindezugu; Cin da zuga	Leaves, stem, roots	Labour, induces breast milk	3	-	-
	<i>Chrozophora senegalensis</i>						
Euphorbiaceae	<i>Bauhinia rufescens</i>	Tso (Hausa)	Leaves	-	1	-	Sc
Euphorbiaceae	<i>Cassia singuena</i>	Kababbago	Leaves	-	1	-	-
Euphorbiaceae	<i>Cassia tora</i>	Damagi	Whole plant	-	1	-	-
Fabaceae:Caesalpinioideae	<i>Daniellia oliveri</i>	Tsatsagi	-	-	1	-	-
Fabaceae:Caesalpinioideae	<i>Detarium senegalense</i>	Ruhu (Hausa) Runhu	-	-	2	-	Sc
Fabaceae:Caesalpinioideae	<i>Isobertinia doka</i>	Tafasa	Whole plant	-	1	-	-
Fabaceae:Caesalpinioideae	<i>Piliogstima thonningii</i>	Kadaura, Maje	Bark/Leaves	Immune booster, stomach ache, breast cancer, sickle cell anemia.	3	Y	Sc
Fabaceae:Caesalpinioideae	<i>Senna sp</i>	Taura	Stem, leaves	Polio;diarrhoea	3	Y	sc
Fabaceae:Caesalpinioideae	<i>Tamarindus indica</i>	Doka	Stem, leaves	-	1	-	-
	<i>Azelia africana</i>						
Fabaceae:Caesalpinioideae	<i>Acacia albida</i>	Kalgo (Hausa)	Leaves, root, seeds	Children convulsion, dysentery (leaves), stomach ache (root), spiritual diseases, pains in the body (seeds)	4	Y	Sc
	<i>Amblygonocarpus andogensis</i>						
Fabaceae:Caesalpinioideae	<i>Entada africana</i>	Raidore	Roots	-	1	-	-
Fabaceae:Caesalpinioideae	<i>Mimosa pigra</i>	Tsarmiya (Hausa)	Bark/Leaves	-	1	Y	Sc
Fabaceae:Caesalpinioideae	<i>Parkia biglobosa</i>	Kawo (Hausa)	Leaves/S/bark	Ulcer, body pains	1	-	Sc
Fabaceae:Mimosoideae	<i>Prosopis africana</i>	Gawu (Hausa)	-	-	2	Y	Sc
Fabaceae:Mimosoideae	<i>Abrus precatorius</i>	Sandanmayu	-	-	1	-	-
Fabaceae:Mimosoideae	<i>Erythrina senegalensis</i>	Tatwasa	-	Child birth/Labour	2	Y	Sc
Fabaceae:Mimosoideae	<i>Indigofera spp</i>	Kadeji	-	-	1	Y	-
Fabaceae:Mimosoideae	<i>Pterocarpus erinaceus</i>	Daurowa , dorowa	Leaves/Bark	Pile in children, appetizer	2		Sc
Fabaceae:Mimosoideae	<i>Swartzia madagascariensis</i>	Kiryu	Bark/Root/Leaves	-	2		Sc
Fabaceae:Papilionoideae	<i>Acalypha</i> spp.	Idonzakara	-	-	1	Y	-
Fabaceae:Papilionoideae	<i>Chrozophora senegalensis</i>	Mingirya	-	-	1	-	-
Fabaceae:Papilionoideae	<i>Hymenocardia acida</i>	Kaikayi ; Baba (Eggon)	Leaves	Fever	2	-	-
Fabaceae:Papilionoideae	<i>Jatropha curcas</i>	Madobia, Shagini	Leaves	Constipation	2	-	Sc
Fabaceae:Papilionoideae	<i>Securinega virosa</i>	Bayama	-	-	1	-	-

Table 1. Contd.

Fabaceae:Papilionoideae	<i>Ostryoderris stuhlmanii</i>	Majinachiya	-	-	1	-	-
Fabaceae:Papilionoideae	<i>Phaseolus vulgaris</i>	Beans	Seed powder	-	1	-	-
Graminae/Poaceae	<i>Oryza sativa</i>	Jatau	-	-	1	-	-
Graminae/Poaceae	<i>Pennisetum glaucum</i>	Wuyanbigimin	-	Impotence	1	-	-
Labiatae	<i>Hyptis suaveolens</i>	Maganizono	-	Mental illness	1	-	-
Labiatae	<i>Ocimum gratissimum</i>	Basil	-	-	1	-	-
Labiatae	<i>Ocimum basilicum</i>	Doddaya /Tagida	-	Cough	1	-	-
Lauraceae	<i>Cassytha filiformis</i>	Rumfangada	-	Chest problem	1	-	-
Liliaceae (Alliaceae)	<i>Allium cepa</i>	Onion	bulb	-	1	Y	-
Liliaceae (Alliaceae)	<i>Allium sativa</i>	Garlic	„	-	1	Y	-
Liliaceae (Aloaceae)	<i>Aloe vera</i>	Moda	Leaves	-	1	Y	-
Liliaceae (Asparagaceae)	<i>Asparagus africanus</i>	Kayanbera	-	-	1	Y	-
Loganiaceae	<i>Anthocleista vogelii</i>	Kwari	-	Infertility	1	-	-
	<i>Agelanthus dodonefolius</i>						
Loranthaceae	<i>Tapinanthus globiferus</i>	Kauche on (kargo, dorowa, maji, madachi, itatuwa, sabara)	Whole plant	-	8	-	-
	<i>sida acuta</i>						
Loranthaceae	<i>Urena lobata</i>	Kauche on (kargo, dorowa, maji, madachi, itatuwa, sabara)	Whole plant	-	8	-	-
	<i>Azadirachta indica</i>						
Malvaceae	<i>Khaya senegalensis</i>	Kalkashinkwado	Whole plant	Veneral diseases	1	-	-
Malvaceae	<i>Pseudoceadrela kotschyi</i>	Kafimallam	-	-	1	-	-
Meliaceae	<i>Ficus platyphylla</i>	Dogonyaro, neem	-	-	2	Y	-
Meliaceae	<i>Ficus spp</i>	Madachi (Hausa), mahogany	Bark	Stomach disturbance	2	Y	Sc
Meliaceae	<i>Ficus sur</i>	Tuna	Stem	-	1	-	-
	<i>Ficus sycomorus</i>						
Moraceae	<i>Moringa oleifera</i>	Gamji (Hausa)	Leaves/S/bark	Body pains, fertility, spiritual disease, cell anaemia; pile, spiritual disease.	3	-	-
	<i>Musa paradisiaca</i>						
Moraceae	<i>Musa sapientum.</i>	Baure	Leaves	Infertility, stomach ache	1	-	-
Moraceae	<i>Eucalyptus spp.</i>	Baurekiyashi	S/bark	Rheumatism	1	-	-
Moraceae	<i>Psidium guajava</i>	Baure (Hausa)	Whole plant	Swollen body	1	-	-
Moringaceae	<i>Lophira alata</i>	Zogale	Leaves, roots	Fever, typhoid	1	Y	Sc
Musaceae	<i>Ostryoderris stuhlmanii</i>	Plantain	-	-	1	-	-
Musaceae	<i>Phaseolus vulgaris</i>	Banana	Trunk	Measles	1	Y	-
Myrtaceae	<i>Oryza sativa</i>	Sanda I	-	-	1	Y	-
Myrtaceae	<i>Pennisetum glaucum</i>	Gwaiba	Leaves	Pile	1	-	-
Ochnaceae	<i>Hyptis suaveolens</i>	Kujeme	Leaves	-	1	-	-

Table 1. Contd.

Olacaceae	<i>Olax subscorpioidea</i>	Gwano (Hausa)	Leaves, stem bark, roots	-	5	Y	Sc
Olacaceae	<i>Ximenia americana</i>	Tsada (Hausa)	Bark/Root	-	1	-	-
Palmaceae	<i>Elaeis guineense</i>	Palm tree	Roots	-	1	-	-
Pedaliaceae	<i>Sesamum indicum</i>	Ridi	Seeds	For healthy babies	1	-	-
Pedaliaceae	<i>Sesamum spp.</i>	Kalkashi	Leaves	-	1	-	-
Polygalaceae	<i>Securidaca longepedunculata</i>	Sanya; Uwarmagunguna	Stem, leaves and roots	Mental illness	4	Y	Sc
Rhamnaceae	<i>Ziziphus murtaniaca</i>	Magarya			1	-	Sc
Rhamnaceae	<i>Ziziphus spina cristi</i>	Kuma			1	-	Sc
Rosaceae	<i>Malus domestica</i>	Apple tree	-	-	1	-	-
Rubiaceae	<i>Crossopteryx febrifuga</i>	Kashinawaki (Hausa)	Bark/Root	-	1	-	Sc
Rubiaceae	<i>Fadogia ancylantha</i>	Bakingagau	Roots	-	1	-	-
Rubiaceae	<i>Fadogia agrestis</i>	Bakinganye	-	-	1	-	-
Rubiaceae	<i>Feretia apodanthera</i>	Kurukuru (Hausa)	Bark/Root	-	1	-	-
Rubiaceae	<i>Gardenia erubescens</i>	Gaude	Tender leaves and roots	-	1	-	-
Rubiaceae	<i>Mitracarpus scaber</i>	Gogamasu (Hausa)	Whole plant	-	1	-	Sc
Rubiaceae	<i>Nauclea Latifolia</i>	Tufashiya	Stem and leaves	Ring worms and fever	2	-	Sc
Rutaceae	<i>Citrus limon</i>	Lemon	-	-	1	Y	-
Rutaceae	<i>Citrus sinensis</i>	Orange	-	-	2	Y	-
Sapindaceae	<i>Paullinia pinnata</i>	Hanubijary	Leaves	Menstruation problem, pains	3	-	-
Sapotaceae	<i>Vitellaria paradoxa</i>	Kadeyan, kadai	-	-	2	-	Sc
Solanaceae	<i>Solanum esculentum</i>	Tomatoes	Fruits	Night blindness	1	-	-
Solanaceae	<i>Physalis angustifolia</i>	Matsarmama	Whole plant	-	1	-	-
Solanaceae	<i>Solanum spp.</i>	Kautankura	-	-	1	-	-
Solanaceae	<i>Solanum sp</i>	Gardili (Eggon)	-	Snake bites, weakness of body	1	-	-
Sterculiaceae	<i>Sterculia setigera</i>	Kukuki	Leaves	Stomach ache, body pains.	2	Y	Sc
Tiliaceae	<i>Grewia mollis</i>	Danrgaza	-	Teething	1	-	-
Verbenaceae	<i>Lippia multiflora</i>	Angontaki	Leaves	Chest pains	1	-	-
Verbenaceae	<i>Starchytapheta spp.</i>	-	-	Impotence	1	-	-
Verbenaceae	<i>Vitex doniana</i>	Dunya	S/bark	Leprosy	2	-	-
Vitaceae	<i>Cissus spp</i>	Yakuwanfatake	-	-	1	-	-
	Unidentified	Gbandibo (Eggon)	-	-	1	-	-
	Unidentified	Iri (Eggon)	-	Typhoid fever	1	-	-
	Unidentified	Sandanayu (Hausa)	-	Filaria fever	1	-	-
	Unidentified	Ruche (Hausa)	-	-	1	-	-
	Unidentified	Fada (hausan)	Seeds	-	1	-	-
	Unidentified	Muburiki (hausan)	Leaves	Infertility	1	-	-
	Unidentified	Gabonkare (hausan)	-	Cancer	1	-	-

Table 1. Contd.

Unidentified	Yahutu (hausa)	-	Dysentery	1
Unidentified	Mafida (hausa)	-	Child birth/labour	1
Unidentified	Pageli (Fulani)	-	Malaria, stomach ache, ulcer	1
Unidentified	Idakudulhi (Fulani)	-	Cancer	1
Unidentified	Dirbidi (Fulani)	-	Skin diseases	1
Unidentified	Gerorihi (Fulani)	-	Birth control	1
Unidentified	Adekehi (Fulani)	-	-	1
Unidentified	Chapbuli (Fulani)	-	-	1
Unidentified	Kojodi (Fulani)	-	-	1
Unidentified	Jasmi (Fulani)	-	-	1
Unidentified	Nelbi (Fulani)	-	-	1
Unidentified	Alali (Fulani)	-	-	1
Unidentified	Gora (hausa)	Leaves	-	1
Unidentified	Palwaya	Leaves	-	1
Unidentified	Sandanmallamai (hausa)	Bark/Leaves	-	1
Unidentified	Tshukutshuku (hausa)	Root/Leaves	-	1
Unidentified	Tsintsiya (hausa)	Bark	-	1
Unidentified	Sinferu	-	-	1
Unidentified	Sasagi (Hausa)	-	-	1
Unidentified	Rumba (Hausa)	-	-	1
Unidentified	Wurishi (Hausa)	-	-	1
Unidentified	Bakingayin (Hausa)	Leaves	Miscarriage, infertility	1
Unidentified	Lokodaban	-	-	1
Unidentified	Susajaki (hausa)	Leaves	Cancer	1
Unidentified	Hurushi (hausa)	-	-	1
Unidentified	Ogunacher (Igala)	-	-	1
Unidentified	Korikoshia (hausa)	-	Pile	1
Unidentified	Ayangwankaya (hausa)	-	Children problem, teething, etc.	1
Unidentified	Warshi (hausa)	Roots	-	1
Unidentified	Dokarafi (hausa)	Roots	-	1
Unidentified	Giri (hausa)	Whole plant	-	1

- : Not disclosed; Y: Yes cultivated; Sc: Scarce.

many others (Table 1). Thirty-two species in 16 families were plants that used to be locally abundant but are gradually becoming scarce of

which 75% are trees (Table 1 and Figure 13). The TMPs noted that they have to go distances or buy these scarce plants from medicinal plant sellers.

Ibrahim et al. (2010) reported that medicinal plants sold by herb sellers are mainly forest species and other species not easily accessible

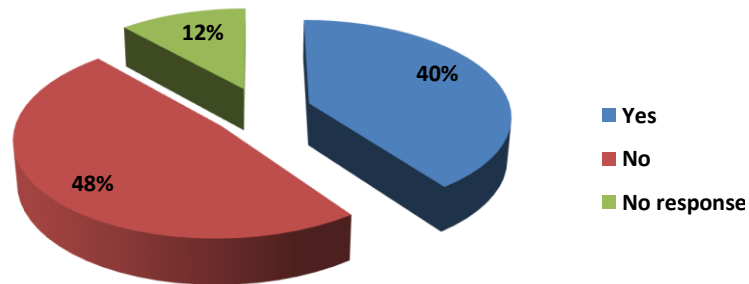


Figure 9. Level of awareness of depletion of plant biodiversity by the TMPs of Nasarawa State.

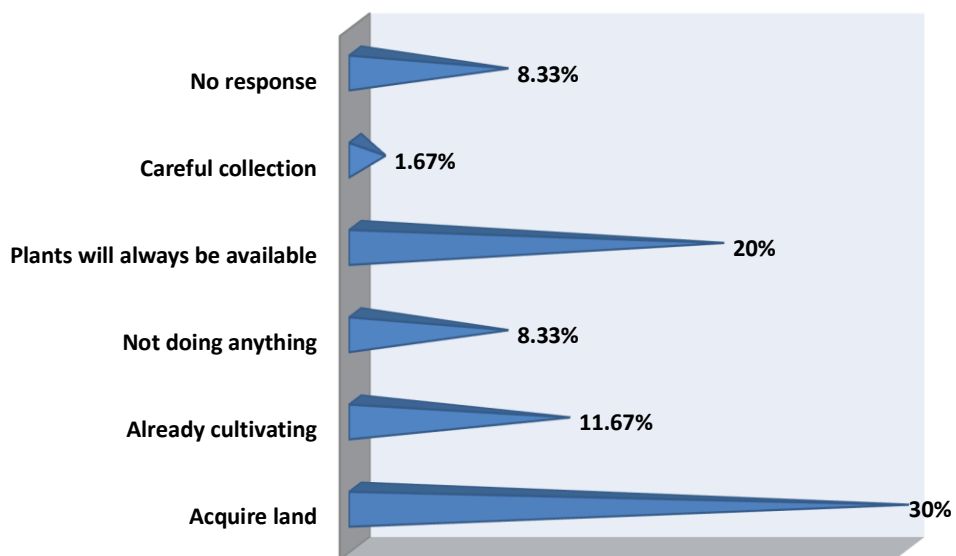


Figure 10. Percentage of Respondents TMPs involved in plant conservation in Nasarawa State.

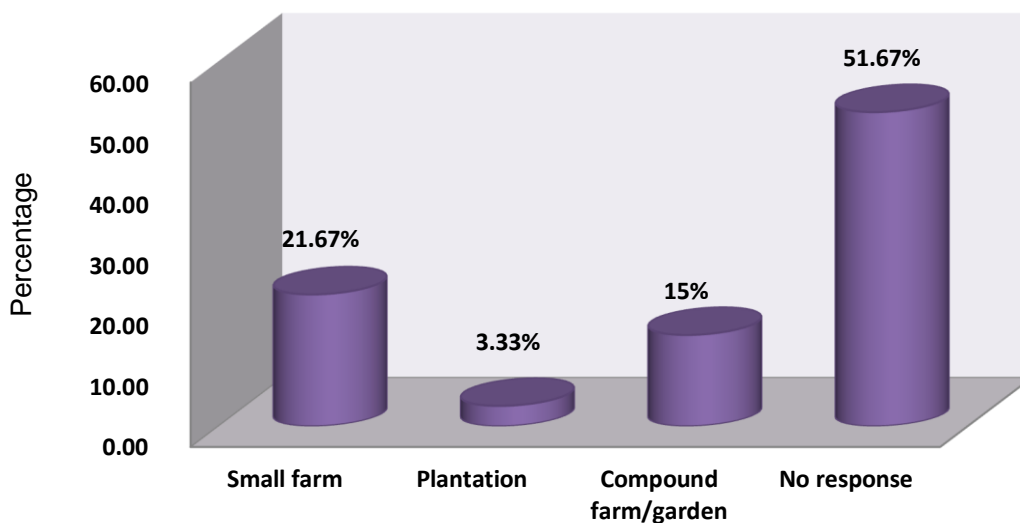


Figure 11. Scale of cultivation of medicinal plants by the TMPs of Nasarawa State.

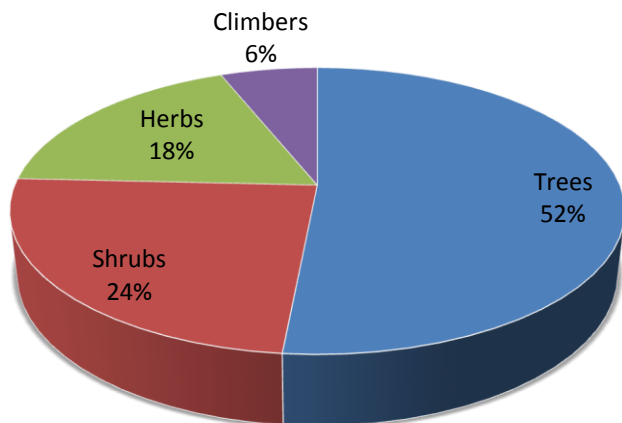


Figure 12. Percentage plant Habit of cultivated medicinal plants by the TMPs of Nasarawa State.

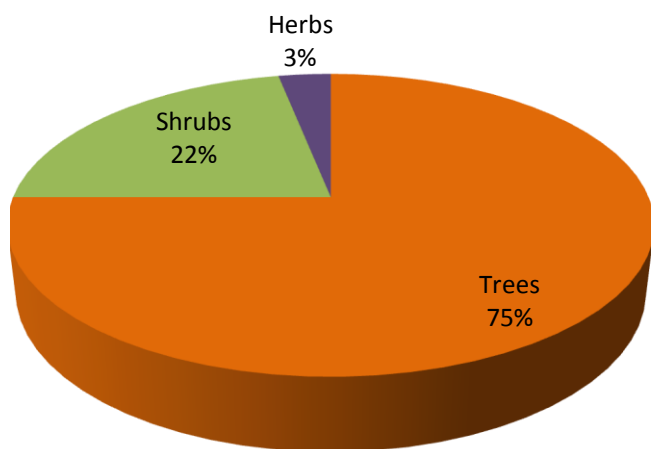


Figure 13. Percentage plant Habit of medicinal plants not easily accessible scarce to the TMPs of Nasarawa State.

to the TMPs in their locality. Therefore, it is quite expected that a large amount of medicinal plants not easily accessible by TMPs of Nasarawa state are trees. The depletion of this species may mostly likely be as a result of infrastructural development. More so, most trees are perennial and cannot be easily regenerated like herbs. Herbs which are mostly annual will most likely regenerate annually during rainy season, and trees that are cut down without any replacement are lost forever making it difficult for the TMPs to access them. This necessitated going far into the forest for species that were previously at close proximity to them. The only herb documented to be scarce in this study is *Mitracarpus scaber*. *M. scaber* is a weed of abandoned farmland or uncultivated piece of land (Hutchinson and Dalziel, 1954; Burkill, 1995) and as more land area are being converted for urbanization and agricultural purposes, the populations of this species may be decimated.

Conclusion

Large numbers of plant species were documented for the treatment of various ailments which might be a lead for drug discovery for treatment of those ailments. Very few educated persons are beginning to take interest in the profession due to the growing awareness and this trend should be encouraged as the country works towards achieving MDG goal with regards to healthcare and poverty alleviation. The study also revealed that majority of the TMPs in Nasarawa State was not aware of sustainable use and biodiversity conservation of medicinal plants. Very few of the TMPs who were aware of endangerment were involved in one form of plant conservation or the other; hence, there is need to raise awareness through grass roots sensitization on biodiversity conservation and sustainable use of medicinal plants and also training in simple form of plant conservation to ensure sustainability and quality control of their medicinal plant products. Further study will be undertaken to identify the very large number of unidentified plants specimen from this study which will eventually add to the compendium of local names and scientific names of plants in Nigeria. It is recommended that similar studies be conducted in other states and ecological zones of the country to enable a country-wide solution approach.

Conflict of Interests

The authors have not declared any conflict on interests.

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