

## AN ETHNO-SURVEY OF MEDICINAL TREES OF KABOBI VILLAGE, NORTHERN KATSINA, NIGERIA

M.N. Danjuma<sup>1</sup>, H. Darda'u<sup>2</sup>

<sup>1</sup>Department of Geography, Isa Kaita COE Dutsin-ma,

<sup>2</sup>Department of Geography, Umaru Musa Yar'adua University,  
Katsina, NIGERIA.

<sup>1</sup>nurdkat@yahoo.co.uk

### ABSTRACT

*The use of trees or parts as remedies of certain illnesses is not only common practice but fundamental to health care regime of millions of people all over the World. The aim of the study is to determine the medicinal applications of trees of Kabobi village in Katsina State Nigeria for an improved health system. The study is a survey type where a total of 29 respondents were drawn from four (4) vegetation user groups of the area using systematic sampling technique. Semi-structured interview schedule was used to collect data which was presented in tables and bar graphs and discussed appropriately. The study found out that there are eight (8) illness categories which are treated using 32 medicinal trees of the area. It is therefore recommended that the seedlings of medicinal trees should be provided to user groups of the area for planting in order to maintain the resource base.*

**Keywords:** Health care regime, illnesses categories, user groups, resource base

### INTRODUCTION

A nexus between humans, ill-health and folks medicine cannot be traced from recent epoch because since origin man has been battling with various forms of diseases and/or illnesses. As generations pass by and humans suffer from illnesses, the searches for remedy to these diseases propel the development of traditional knowledge of medicines, remedies as well as norms. This traditional medicines yet so important to local health care system is alienated from modern health care regime because of the Western richly scientific methods. Alves and Rosa (1997) contended that under the impact of industrialization and urbanization, western medicine has displaced indigenous medical systems in many areas, in the process leaving many without any health care. Even though traditional medicine is not practiced in most advanced World, the interest in it (of different cultures) has increased significantly in recent years in developed countries owing to its growing value (Nelson-Harrison et al., 2002) and obviously because of the fact that many prescription drugs have originated from the tropical flora. In South Africa with all advancements, up to 60% of the population consults traditional healers (van Wyk et al., 1997), especially in rural areas where traditional healers are more numerous and accessible than Western health-care providers. Rural dwellers in Mali rely mainly on remedies based on plants found in forest lands surrounding their villages. For more serious illnesses, patients may see local specialists who use a combination of drugs and herbal medicines (Emerton, 1996). Traditional medical regime involves the use of various substances ranging from plants and animal as well as their organic by products such as charcoal and resins in Katsina area (Danjuma, 2010) as well as hooves, skins, bones, feathers and tusks (Adeola, 1992) respectively.

Traditionally, plants are reliable sources of treatment of diseases in different parts of the World (Eisenberg et al., 1993). Their use contributes significantly to primary health care delivery (Holetz et al., 2002) as they are regarded as invaluable sources of pharmaceutical

products (Olalde, 2005). Many medicinal plant species have spread globally both via intentional and carefully planned transfers and as the unintentional outcome of people's movements (Fowler and Hodgkin, 2004). Globally, medicinal plants have been unique sources of medicines and constituted the most common human use of biodiversity (Hiremath and Taranath, 2010). In African societies, the tradition of collecting, processing and applying plants and plant-based medications have been handed down from generation to generation. Medicinal plants have traditionally occupied an important position in the socio-cultural, spiritual and medicinal arena of rural and tribal lives in Sudan (Musa et al., 2011). von Maydell (1996) reported that traditional medicine, with medicinal plants as their most important component, are sold in market places or prescribed by traditional healers in their homes.

A traditional application of trees as medicine is not uncommon in Africa. For example, of the many species of rural Hausa land of Nigeria, 254 species are used (in 1854 remedies) for illnesses that are manifested physiologically such as fevers, vomiting, pain, and so on and 215 (overlapping) species are used (in 452 remedies) for conditions that may include tangible signs but are managed through the mediation of spirits, witches, and sorcery (Etkin, 2002). Moreover, a survey of trees of Central Nigeria (Kwara State) has shown that rural and urban people make use of a great range of plants from their environment. Of the 52 species recorded, all the plants have one or more medicinal uses, 17 are used as food, 3 are used as cosmetics, 1 as insecticide, and the others for commercial purposes (Bhat et al., 1989). And according to the people from Local Traditional Healers Association of Mont Mandingues forest near Bamako all inventoried species have a use in traditional healing, although some villagers do not know the use of all of them. In the same area, two thirds of the 100 species of trees available are used by villagers for pharmaceutical purposes (Sow and Anderson, 1996). A total of 36 plant species distributed in 24 families were found to be used locally for treating various gastrointestinal disorders including diarrhoea, dysentery, abdominal cramps, gut disturbances, stomach disorders, upset and aches in the Eastern Cape Province, South Africa (Olajuyigbe and Afolayan, 2012). Aniagu et al., (2005) reported that *Guiera senegalensis* is highly used tree in traditional medicine, its branches, leaves, bark and roots are recommended for the treatment of stomach pain and dysenteric diarrhoea, syphilis, beriberi, leprosy and impotency (Kerharo et al., 1948). The shrub is used externally as an antiseptic healing preparation for wounds, stomatitis, gingivitis and syphilitic cankers (Kerharo and Adam, 1974). It has also been demonstrated that preparations made from its galls possess antiviral properties (Lamien et al., 2005). A tea made from its leaves is prescribed by the oral route to treat eczema (one litre per day), against attacks of fever, and to cure chest ailments and colds (Malgras, 1992). Fresh mashed or chewed or cut leaves when placed on a wound staunch bleeding (Berhaut, 1967). Among numerous medicinal properties reviewed in Hall et al. (1997); the bark of *Parkia biglobosa* is used to treat infectious diseases and ailments of the digestive system, its leaves are used for wounds and skin ailments, the roots are used against epilepsy and the pulp as a febrifuge. The bark of *Fardherbia albida* is used for the treatment of coughs (Depommier, 1996). Both *Adansonia digitata* and *Sterculia setigera* are excellent regulators of digestion. Baobab leaf powder contains pectins and hemicellulose which prevent constipation and diarrhoea (Bergeret and Ribot, 1990). The average vitamin C content of the pulp of *Adansonia digitata* fruit is over 250mg/kg which is used as medicine, it also helps to maintain low blood pressure, enhance immunity against tropical diseases and reduce incidence of cataract development and coronary disease (Sidibe et al., 1996).

## STUDY AREA

Katsina is located some 160 miles east of the city of Sokoto, and 84 miles northwest of Kano, close to the border of Maradi region in Niger (Wikipedia, 2012). It is one of the North West states of Nigeria that shares its Northern border with the Maradi department in Niger Republic. Katsina covered a landmass of about 142 km<sup>2</sup> (Wikipedia, 2012), is a city (formerly a city-state), a Local Government Area in northern Nigeria and the capital of Katsina State.

The Census results of 2006 in Nigeria put the population of Katsina to 315,459 people and an average growth rate of 2.8% (NPC, 2006).

The climate of the study area is the 'Aw' type as determined by Koppen in which distinctive wet and dry seasons are caused by the fluctuations of the ITCZ (Inter Tropical Convergence Zone) or the ITD south to north (rainy season), vice versa (dry season) and meeting at a front. The ITCZ separates humid maritime air mass originating from the Atlantic Ocean and dry desert air mass. The ITCZ follows the apparent movement of the sun, (northwards in April – July and southwards in September – October). Four seasons are recognized based on the weather and agricultural activities tied to them in the Hausa land (Olofin, 1987). Temperature is generally cool in the morning, hot in the afternoon, and very cool in the evening. Maximum temperature range in Katsina is between 29<sup>0</sup>C and 38<sup>0</sup>C but harmattan season (November to February) lowers temperature to about 18<sup>0</sup>C and 27<sup>0</sup>C in the noon. The whole of Katsina area is covered by Lithosols and the soils of lateritic formation formed under alternating dry and wet seasons. Soil fertility except in the flood plains is partially low owing to low organic matter content, intensive cultivation, and poor management especially along major farming densely populated areas. With the exception of some exotic species planted as ex-situ conservation trees, the vegetation in Katsina area and further north in parts of Maradi is composed of indigenous species which grow spontaneously. The trees found include *Parkia biglobosa*, *Adansonia digitata*, *Khaya senegalensis*, *Fadherbia albida*, *Tamarindus indica*, and *Borassus aethiopum*, and exotic species *Azadirachta indica*, *Eucalyptus camaldulensis*. Few fruit trees are grown on farms such as *Magnifera indica* and *Anacardium occidentale*. Man and his animals play a great role in modifying the vegetation cover in the area and as a result continuous cover of shrubs overtakes the once woody landscape.

## METHODS

The main primary data sources were the transect walk (for species inventory) and group interview administered on sample of respondents drawn from the population of vegetation user groups of the study village.

This study is based on user groups who are regarded as knowledgeable in vegetation resources use and management in the area. These user groups formed the sampling frame from which the target population as well as respondents was drawn. A total of four (4) user groups were identified in Kabobi village of Katsina in Nigeria and these are: farmers, herbalists, blacksmiths and wood carvers. Systematic sampling technique was used to select 29 respondents out of the total population of 86 individual. Members of the population were assigned number for identification and based on these numbers each 3rd order consecutive individuals of a user group was selected as a respondent. Group interview was administered to collect data using checklist in late afternoon when respondents retire from occupational activities.

The total population, its composition (user groups) and respondents are based on reconnaissance study and thus are summarized in table 1.

**Table 1. Population and sample of respondents of Kabobi Village**

S/No.	User Groups	Population of Study	Sample of Respondents
1.	Farmers	48	16
2.	Herbalists	20	7
3.	Wood carvers	7	2
4.	Blacksmiths	11	4
	Total	86	29

Source: Fieldwork (2012)

## RESULTS AND DISCUSSION

### Medicinal Plants of the Study

The study found out that irrespective of the dry climate and rural over dependence on trees of the study area, the inventory yielded 46 trees of which 32 are medicinal as presented in table 2. The use of the trees for prevention of illnesses is not established by this study even though some respondents mentioned such.

**Table 2. Medicinal trees of Kabobi Village (Part-A)**

<i>Inventoried Trees(Botanical Names)</i>	<i>Local Names(Hausa)</i>	<i>Location found in the Village</i>
<i>Diosphyros meslifomis</i>	Kanya	In the bush, on farms
<i>Azadirachta indica</i>	Bedi	In the bush, in compounds, on farms
<i>Fardherbia albida</i>	Gawo	On farms, in bush
<i>Piliostigma reticulatum</i>	Kalgo	In the bush
<i>Balanites aegyptiaca</i>	Aduwa	In the bush and few in farms
<i>Tamarindus indica</i>	Tsamia	In the bush
<i>Isobertina doka</i>	Doka	In the bush
<i>Commiphora africana</i>	Dashi	In the bush
<i>Magnifera indica</i>	Mangwaro	On farms and enclaves
<i>Lannea acida</i>	Faru	In the wild
<i>Hyphaene thebaica</i>	Goriba	In the bush
<i>Acacia sisso</i>	Dakwara	In the bush
<i>Sclerocarya birrea</i>	Danya	In the bush
<i>Proposis africana</i>	Kirya	In the bush and in farms
<i>Borassus aethiopum</i>	Giginya	In the bush
<i>Ziziphus spina-christi</i>	Kurna	In the bush
<i>Acacia macrostachyta</i>	Gardaye	In the bush

Source: Field Work (2012)

**Table 2. Medicinal trees of Kabobi Village (Part-B)**

<i>Inventoried Trees(Botanical Names)</i>	<i>Local Names(Hausa)</i>	<i>Location found in the Village</i>
<i>Butyrospermum paradoxum</i>	Kade	In the wild
<i>Cassia singuena</i>	Runhu	In the wild
<i>Ficus polita</i>	Durumi	In the wild
<i>Ficus thonningii</i>	Chediya	In the bush
<i>Ficus glumosa</i>	Kawari	In the wild
<i>Detarium microcarpum</i>	Taura	In the bush
<i>Parinari macrophylla</i>	Gawasa	In the bush
<i>Albizzia chevalieri</i>	Katsari	In the bush
<i>Boscia salicifolia</i>	Anza	In the bush
<i>Bauhinia rufesceus</i>	Dirga	In the bush and on farms
<i>Parkia biglobosa</i>	Dorowa	In the bush and few on farms
<i>Cassia simmea</i>	Dorowar bature	In compounds and in bush
<i>Eucalyptus camaldulensis</i>	Turare	In compounds and in bush
<i>Maerua angolensis</i>	Ciciwa	In the bush
<i>Entada sudanica</i>	Tawatsa	In the bush
<i>Securidaca longependunculata</i>	Sanya	In the wild

Most trees are found in the wild and bushes and used by all villagers to prepare medicines against certain illnesses only. The results show that the medicinal trees (33 trees) represent 72% of all inventoried trees (46 species) of the area which is a pointer to medicinal value as the highest use. When compared with all other uses, the villagers mentioned that all trees of the area may have medicinal value although some are not known and thus used for one remedy or another.

### **Ethno-medicinal Applications of the Inventoried Trees**

The illness categories in table 3 as well as medicinal applications of species are obtained from the respondents of the study area. The study found out that because of inconsistencies in the naming of certain illnesses among respondents (who possess diverse knowledge), illnesses are categories broadly as in table 3.

Result of the study in table 3 shows that 20 species are used to treat 9 illnesses categories in the area. Illnesses such as pile and fever have wider range of species use while endocrine (diabetes) is treated using one species may be because of its uncommon occurrence in the area and complications.

The result depicted that all illnesses are treated using one or many trees and/or parts. All inventoried species of the area has medicinal value but those that appear in the table are used to treat specific illnesses. Each illness category has certain disease types that are treated using tree(s) parts or a combination of tree based therapy which is prepared locally. The knowledge of this type is acquired intuitively and transferred through generations in the area.

**Table 3. Ethno-medicinal Applications of Trees according to respondents**

<i>Illness Categories</i>	<i>Treated Illness</i>	<i>Species used for the treatment (Botanical names)</i>	<i>Parts of species used</i>
Endocrine	Diabetes	<i>Securidaca longependunculata</i>	R
Fever/ache	All sort but commonly malaria	<i>Ficus thonningii</i> , <i>Eucalyptus camaldulensis</i> ; <i>Azadirachta indica</i> , <i>Boscia salicifolia</i>	B, L L; L; B, L, Sh
Gastro-intestinal	Stomach ache, diarrhoea and stool disorder	<i>Balanite aegyptiaca</i> , <i>Isoberlina doka</i> , <i>Diospyros mesliformis</i> ,	Br, & R, Fr, L, Sh; B; Br, Fr, Wp,
Mouth	Rashes, sores, aches and inflammations of the gum	<i>Fardherbia albida</i> , <i>Azadirachta indica</i> ,	B,L,Fr,Br,Sh; Br
Pile	Pain, itching and protrusion of the anus	<i>Piliostigma reticulatum</i> , <i>Tamarindus indica</i> , <i>Ziziphus spina-christi</i> ; <i>Magnifera indica</i> , <i>Parkia biglobosa</i> , <i>Acacia sisso</i>	B,Br,Fr; B, Fr, Sh; B, Br, Fr, L; B, Fr; B L, R
Pregnancy/Lactation	All pregnancy disorders and breast milk booster enhancing tonic	<i>Securidaca longependunculata</i> ; <i>Maerua angolensis</i> ; <i>Ficus polita</i>	B; L; B, L, Br
Respiratory	Pneumonia, asthma, lung infections and cold	<i>Cassia simmea</i> <i>Ficus thonningii</i>	B, R, Sh; B,L
Snake bites	Snake bitten area, poison treatment and anti-venom	<i>Entada sudanica</i> <i>Commiphora africana</i>	L, Sh; L, R, S, Sh
Skin	All sort of skin disease but especially eczema, rashes	<i>Azadirachta indica</i> , <i>Acacia sisso</i>	B,Fr,L,O,Sh; L, R

Source: Field Work (2012)

**Codes of Parts Used**

B – Bark, Br – Branch, Fr – Fruit, L – Leaves, O – Oil, R – Root, S – Seed, Sh – Shoot, Wp – Whole part

**Species healing preference using fidelity level index**

All species in table 3 have the ability to treat an illness or many illnesses of different illness categories. For specific illnesses, preference is established based on the ability of the species to treat particular illness. This preference is determined using the fidelity level (FL) formula of Friedman et al. (1986) as: **FL (%) =  $N_p/N \times 100$** ,

where  $N_p$  is the number of use-reports cited for a given species for a particular ailment and  $N$  is the total number of use-reports cited for any given species.

**Table 4. Species fidelity level according to Illness Categories**

<i>Species used for the treatment of illnesses</i>	<i>No. of use-report (N)</i>	<i>Species fidelity level FL (%)</i>
<i>Acacia sisso</i>	2	66.66
<i>Azadirachta indica</i>	3	100
<i>Balanite aegyptiaca</i>	1	33.33
<i>Boscia salicifolia</i>	1	33.33
<i>Cassia simmea</i>	1	33.33
<i>Commiphora africana</i>	1	33.33
<i>Diospyros mesliformis</i>	1	33.33
<i>Entada sudanica</i>	1	33.33
<i>Eucalyptus camaldulensis</i>	1	33.33
<i>Fardherbia albida</i>	1	33.33
<i>Ficus thonningii</i>	2	66.66
<i>Ficus polita</i>	1	33.33
<i>Isobertina doka</i>	1	33.33
<i>Maerua angolensis</i>	1	33.33
<i>Magnifera indica</i>	1	33.33
<i>Parkia biglobosa</i>	1	33.33
<i>Piliostigma reticulatum</i>	1	33.33
<i>Securidaca longependunculata</i>	2	66.66
<i>Tamarindus indica</i>	1	33.33
<i>Ziziphus spina-christii</i>	1	33.33

Source: Fieldwork (2012), N = 3 (highest use report)

Determination of fidelity level is so important because many species may be used in the same use category even though they are most valuable in treating certain illness. High FLs (near 100%) are obtained for trees for which almost all user reports refer to its specific use for treatment and low FLs are obtained for trees that are used for other treatments.

Certainly all trees have the specific ability to treat an illness or many from the categories. Thus they are used solely for the treatment of those illnesses in a preferential order because there may be others that can do such. Species such *Acacia sisso*, *Azadirachta indica*, *Ficus thonningii*, and *Securidaca longependunculata* are with highest fidelity index and therefore most preferred for the treatment of specific illnesses.

#### **Parts of trees used for the preparation of medicines**

The study found out that the respondents uses bark, branch, fruit, leaves, oil, root, seed, shoot, and whole part of the trees in various proportions depending on illness and medicinal need.

Figure 2 is obtained from the total number of use report of each part used in all illness categories in table 3. The result reported that bark, leaves, and shoot are the most used parts for the treatment of illnesses in the area. This may be because they are easily sourced and processed to give the desired medicine. Moreover, barks, leaves, and shoots unlike other parts

can be accessed and use through any mode of administration. However, oil and seeds are hard to access and therefore their use is discouraged by scarcity and difficulty of sourcing.

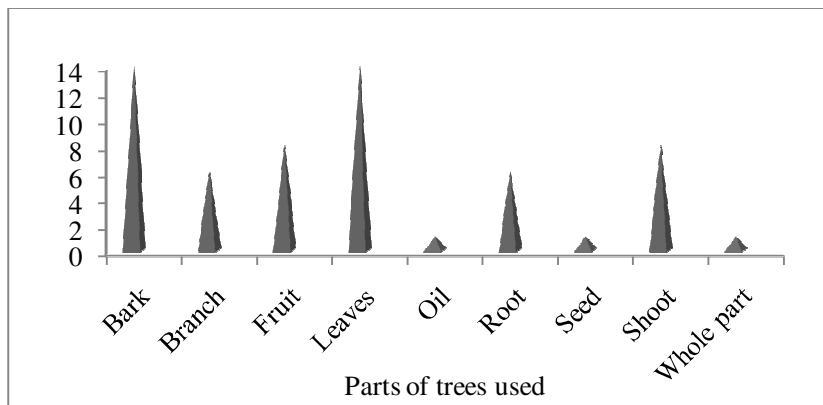


Figure 2. Parts of trees used based on medicinal applications

### Mode of Administration of medicines

Result of the study found out three (3) modes of administration of medicines of the respondents of the area as shown in figure below. These are: oral, nasal and external modes. However nasal administration is never used by any person may be because it is fatal and therefore needs experience than other modes.

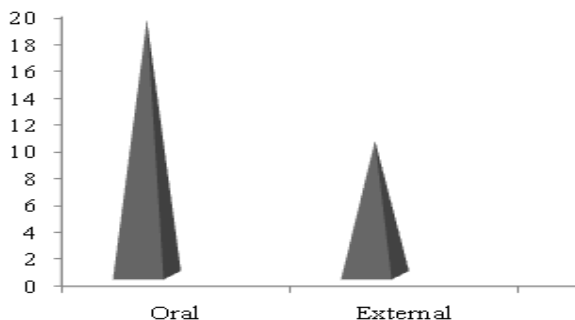


Figure 3. Modes of administration of medicines based on respondents

Results in figure 3 show that majority of the respondents that constitute about 70% administer medicines orally. This means that using whatever parts and in whatever form (solid, liquid), the medicines are taken through mouth. Oral administration is common because it is probably the only way the local technology can care for as the area’s medical regime is indigenous using only the folks knowledge. Certainly most internal diseases such as gastro-intestinal diseases, fever, diabetes and diarrhoea are treated by oral ingestion of medicines. Other way through which medicine is administered is the external which only treats external diseases such as eczema, rashes, bites, piles and eye sores. This is practiced but not very frequent because even these external diseases are in other way treated by oral medications.



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