



Survey of Floristic Diversity of Medicinal Plant (Trees) in Federal University Gusau, Zamfara State Nigeria

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ABSTRACT

This research was carried out to survey the floristic diversity of medicinal trees in federal university Gusau, Zamfara state, Nigeria. A structured Questionnaire was organized in English language and common and local names of each plant were written on it. The questionnaire was divided into two section, namely section A and B. In section A, the socio-demographic information of the respondents was recorded, and information on medicinal trees was recorded, in section B. Thirty (30) questionnaire was administered on each medicinal tree plant. The target groups for this study (Ethno botanical data) were herbalists, farmers, civil servant, old folk, motorbike rider, students and other people of old age who have practiced and used medicinal plants. The identification of the plants was achieved by the aid of herbarium specimen and literature on Nigerian medicinal plant. Thirty (30) medicinal trees were identified which belong to the seventeen (17) families. The plants identified are used in the treatment of several diseases which include dysentery, stomach ache, tooth ache, ringworm, constipation and eczema. The most common parts used are leaves (37%), stem bark (19%), seed (2%), root (11%), fruit (2%), flower (2%) and whole plant (2%). About 90% of the medicinal trees in this research are prepared through decoction. Further research is recommended on floristic diversity of medicinal grass, shrubs, herbs, vines and lianas found at Federal University Gusau.

1.0 INTRODUCTION

Plants have been utilized as medicines for thousands of years (Samuelsson, 2004). Since the beginning of human civilization, medicinal plants have been used by mankind for its therapeutic value. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources. The plant-based, traditional medicine systems continue to play an essential role in health care, with about eighty percent of the world's inhabitants relying mainly on traditional medicines for their primary health care (Owolabi *et al.*, 2007). These medicines initially took the form of crude drugs such as tinctures, teas, poultices, powders, and other herbal formulations (Samuelsson, 2004).

Medicinal plants are plants containing inherent active ingredients used to cure disease or relieve

pain (Okigbo *et al.*, 2008). The use of traditional medicines and medicinal plants in most developing countries as therapeutic agents for the maintenance of good health has been widely observed (UNESCO, 2009). The ongoing growing recognition of medicinal plants is due to several reasons, including escalating faith in herbal medicine (Kala *et al.*, 2005). The medicinal properties of plants could be based on the antioxidant, antimicrobial antipyretic effects of the phytochemical in them (Cowman, 1999) and (Adesokan *et al.*, 2008). According to World Health Organization, medicinal plants would be the best source to obtain a variety of drugs. Therefore, such plants should be investigated to better understand their properties, safety and efficacy (Nascimento *et al.*, 2000).

The constant rising demand of plant-based drugs is unfortunately creating heavy pressure on some selected high-value medicinal plant populations

in the wild due to over-harvesting. Several of these medicinal plant species have slow growth rates, low population densities, and narrow geographic ranges; therefore they are more prone to extinction (Jablonski, 2004).

Conversely, because information on the use of plant species for therapeutic purpose has been passed from one generation to the next through oral tradition, this knowledge of therapeutic plants has started to decline and become obsolete through the lack of recognition by younger generations as a result of a shift in attitude and ongoing socio-economic changes (Kala, 2006). Furthermore, the indigenous knowledge on the use of lesser-known medicinal plants is also rapidly declining. Continuous erosion in the traditional knowledge of many valuable plants for medicine in the past and the renewal interest currently, the need existed to review the valuable knowledge with the expectation of developing the medicinal plants sector (Kala *et al.*, 2006).

Herbal medicine has a long history in the treatment of several kinds of disease (Holm *et al.*, 2001). The use for the treatment of disease has been practiced by man for many years and is still being widely practiced even today (Kokwaro, 1993). For many years, people have developed a store of empirical information concerning the therapeutic values of local plants before orthodox medical practice appeared. Although periods of trial, error, and success, these herbalists and their apprentices have accumulated a large body of knowledge about medicinal plants. Currently, the global market for medicinal plants has been estimated to be around US \$62 billion and the demand is growing rapidly (Indian Council of Medical Research, 2003). It is globally recognized that medicinal plants play a significant role in providing health benefits to human beings. The World Health Organization (2000) has estimated that 80 % of the inhabitants of the world rely mainly on traditional medicines for their primary health care needs, and it may be presumed that a major part of traditional healing involves the use of plant extracts or their active principles. Diseases account for approximately one-half of all deaths in tropical countries (Iwu, 1999). Medicinal plants are rich in a wide variety of secondary metabolites, such as tannins,

terpenoids, alkaloids, and flavonoids, which have been found *in vitro* to have antimicrobial properties. Historically, plants have provided a good source of anti-infective agents.

Throughout the ages, humans have relied on nature for their basic needs, for the production of food, shelter, clothing, transportation, fertilizers, flavours and fragrances, and medicines (Cragg and Newman, 2005). Plants have formed the basis of sophisticated traditional medicine systems that have been in existence for thousands of years and continue to provide mankind with new remedies. Although some of the therapeutic properties attributed to plants have proven to be erroneous, medicinal plant therapy is based on the empirical findings of hundreds and probably thousands of years of use.

In the last 40 years, many potent drugs have been derived from flowering plants; including for example *Dioscorea* species (diosgenin), from which all anovulatory contraceptive agents have been derived; reserpine and other anti-hypertensive and tranquilizing alkaloids from *Rauwolfia* species; pilocarpine to treat glaucoma and 'dry mouth', derived from a group of South American trees (*Pilocarpus spp.*) in the Citrus family, two powerful anti-cancer agents from the Rosy Periwinkle (*Catharanthus roseus*), laxative agents from *Cassia*spp, and a cardiotoxic agent to treat heart failure from *Digitalis* species (Newman *et al.*, 2000). Approximately half of the world's flowering plant species are found in the tropical forests. Tropical rain forests continue to support a vast reservoir of potential drug species. They continue to provide natural product chemists with invaluable compounds as starting points for the development of new drugs. The potential for finding more compounds is enormous as to date only about 1% of tropical species have been studied for their pharmaceutical potential (Cragg and Newman, 2005). This proportion is even lower for species confined to the tropical rain forests. To date about 50 drugs have come from tropical plants. The probable undiscovered pharmaceuticals for modern medicine have often been cited as one of the most important reasons for protecting tropical forests. Therefore, the high annual extinction rate is a matter for concern. Although discovered through serendipitous laboratory observation,

three of the major sources of anti-cancer drugs on the market or completing clinical trials are derived from North American plants used medicinally by native Americans, the papaw (*Carica papaya*), the western yew tree (*Taxus brevifolia*), effective against ovarian cancer and the apple (*Podophyllum peltatum*) may used to combat leukemia, lymphoma lung and testicular cancer (Gurib-Fakim, 2006).

2.0 MATERIALS AND METHODS

2.1 Study Area

This study was conducted in Federal University Gusau, Zamfara State, which covers an area of 12 sq km, is located between 12.1285° N and 6.7807°. The state is bounded by Katsina State to the east, Sokoto State to the west, and Niger Republic to the northern part of State.

2.2 Data Collection

This study was conducted from July to November, 2018. Ethno botanical data were obtained using a semi-structured questionnaire method. The target groups for this study were herbalists, farmers, civil servant, old folk, motorbike rider, students and other people of old age who have practiced and used medicinal plants. The questionnaire was divided into two section, namely section A and B. In section A, the socio-demographic information of the respondents was recorded, and information on medicinal trees was recorded in section B. Thirty (30) questionnaire was administered on each medicinal tree plant species. The questionnaire was writing in English language and translated to respondents, common and local names of each plant were written on it.

2.3 Collection and Identification of Plants Specimens

A series of field trips and survey were conducted to collect specimens of the reported plants from the natural vegetation and home gardens with the help of some guides selected among the respondents. Identification of the sampled plants was achieved with the help of Taxonomist, herbarium specimens and literature on Nigerian medicinal plants.

2.4 Data Analysis

A descriptive statistical using frequencies and percentages was used to analyze the socio-demographic data of the respondents.

2.5 Informant Consensus Factor (ICF)

This measure was calculated for each category of ailment to identify the level of agreement among the respondents on the reported medicinal plants used to cure a particular ailment. The ICF was calculated using the relation: $ICF = (nur - nt) / nur - 1$ (Fisseha et al., 2009), where **nur** is the number of citations for each particular ailment and **nt** is the number of species reported to cure that ailment.

Table 1: Medicinal trees identified in Federal University Gusau

S/N. Botanical Name	Common Name	Local Name
1. <i>Azadirachta indica</i>	Neem tree	Dogonyaro
2. <i>Balanites aegyptiaca</i>	Desert date	Aduwa
3. <i>Diospyros mespiiformis</i>	African ebony tree	Kanya/Kaiwa
4. <i>Anogeissus leiocarpus</i>	Alexwood	Marke
5. <i>Fhaidharbia albida</i>	Winter thorn	Gawo
6. <i>Eucalyptus citriodora</i>	Lemon scanted gum	Turare
7. <i>Lannea acida</i>	Plum mango	Faru
8. <i>Mangifera indica</i>	Mango	Mangoro
9. <i>Psidium guajava</i>	Guava	Gwaba
10. <i>Vitellaria paradoxa</i>	Shea butter tree	Kade/Kadanya
11. <i>Adansonia digitata</i>	Baobab tree	Kuka
12. <i>Parkia biglobosa</i>	West African locust bean	Dorawa
13. <i>Vitex doniana</i>	Black plum	Dunya
14. <i>Tamarindus indica</i>	Tamarind	Tsamiya
15. <i>Acacia nilotica</i>	Egyptian mimosa	Bagaruwa
16. <i>Bombax buonopolense</i>	Red silk cotton tree	Kurya
17. <i>Ficus platyphylla</i>	Guttapercha tree	Gamji
18. <i>Bauhenia rufescens</i>	Orchid bush	Jirga
19. <i>Jatropha curcas</i>	Termite plant	Chini da zugu
20. <i>Moringa oleifera</i>	Moringa tree	Zogala
21. <i>Acacia sieberiana</i>	Paperback thorn	Farar kaya
22. <i>Hyphaene thebaica</i>	Dum palm	Goriba
23. <i>Calotropis procera</i>	Sodem apple	Tunfafiya
24. <i>Combretum mucronatum</i>	Combretum	Geza
25. <i>Piliostigma thonningii</i>	Camel foot leaved tree	Kalgo
26. <i>Detarium microcarpum</i>	Tallow tree	Taura
27. <i>Pterocarpus erinaceus</i>	Barwood	Madobiya
28. <i>Sclerocarya birrea</i>	Marula	Danya
29. <i>Terminalia catappa</i>	Indian almond	Umbrella
30. <i>Borassus aethiopicum</i>	African fan palm	Giginya

Table 2: Medicinal uses of surveyed plants.

S/N. Botanical	Common Name	Family	Part(s) Used	Mode preparation	Medicinal Uses
1. <i>Vitellaria paradoxa</i>	Shea butter tree	<i>Sapotaceae</i>	L	Decoction	Ring worm, Ezema and Constipation
2. <i>Acacia nilotica</i>	Egyptian Mimosa	<i>Mimosaceae</i>	S	Grinding	Dysentery
			L	Decoction	Dysentery
			L	Squeezing	Rheumatism
			L	Grinding	Dysentery
3. <i>Piliostigma thonningii</i>	Camel foot leaved tree	<i>Caesalpiniaceae</i>	SB	Decoction	Infertility
			L	Decoction	Stomach pain
			L	Direct eating	Chest pain
4. <i>Azadirachta indica</i>	Neem tree	<i>Meliaceae</i>	L	Paste	Small pox
			L	Squeeze	Stomach ache
5. <i>Combretum mucronatum</i>	Combretum	<i>Combretaceae</i>	R	Decoction	Dysentery
			L	Decoction	Apollo
			L and SB	Decoction	Abdominal pain
6. <i>Hyphaenethebaica</i>	Dum palm	<i>Arecaceae</i>	R	Decoction	Blood in urine
				Infusion	Bladder
				Infection	
				Decoction	
7. <i>Moringa oleifera</i>	Moringa tree	<i>Moringaceae</i>	Fr	Decoction	Stomach ache and Intestinal disorder
			Fl	Decoction	Measles
			L	Decoction	Jaundice.
8. <i>Jatropha curcas</i>	Physic nut	<i>Euphorbiaceae</i>	L and R	Decoction	Malaria and Typhoid fever.
			L	Decoction	Chicken pox.
9. <i>Parkia biglobosa</i>	Locust bean	<i>Mimosaceae</i>	Fr	Decoction	Stomach constipation
			SB	Decoction	Measles
			L	Powder	Body odour
			SB	Decoction	Blood pressure
				Decoction	Men sterility
10. <i>Bauhenia rufescens</i>	Orchid bush	<i>Caesalpiniaceae</i>	R	Decoction	Dysentery and fever
11. <i>Acacia sieberiana</i>	Perback thorn	<i>Fabaceae</i>	L	Decoction	Clean stomach
			R	Decoction	Breast cancer

Table 2: Medicinal uses of surveyed plants. Cont.....

S/N. Botanical	Common Name	Family	Part(s) Used	Mode preparation	Medicinal Uses
12. <i>Anogeissus leiocarpus</i>	Alexwood	<i>Combrtaceae</i>	SB SB L SB	Decoction Chewing Decoction Decoction	Rashes Tooth decay Catarrh Cough
13. <i>Calotropis procera</i>	Sodem apple	<i>Asclepiadaceae</i>	L R	Decoction Decoction	Eczema, Ringworm Gonorrhea& Jaundice
14. <i>FicusPlatypylla</i>	Guttapercha tree	<i>Moraceae</i>	L R	Decoction Decoction	Fever Anti-inflammatory
15. <i>Tamarindusindica</i>	Tamarind	<i>Caesalpiaceae</i>	R S L	Decoction Decoction Decoction	Stomach ache Dysentery Skin cancer
16. <i>Mangiferaindica</i>	Mango	<i>Anacardiaceae</i>	SB Fl L	Concoction Decoction Decoction	Typhoid fever Dysentery and Ulcer Malaria
17. <i>Vitexdoniana</i>	Black plum	<i>Verbenaceae</i>	L L SB	Decoction Decoction Concoction	Dysentery Measles Body weakness
18. <i>Eucalyptus citriodora</i>	Lemon scanted gum	<i>Myrtaceae</i>	L	Decoction	Stomach ache, Malaria, Dirrhoaea, and typhoid fever
19. <i>Fhaidharbiaalbida</i>	Winter thorn	<i>Meliaceae</i>	WP SB	Decoction Decoction	Abdominal Pain, Eyes conjunctivitis, Dysentery. Chewing Chest pain
20. <i>Pterocarpus erinaceus</i>	Barwood	<i>Fabaceae</i>	L	Decoction	Fever
21. <i>Sclerocary abirrea</i>	Marula	<i>Anacardiaceae</i>	SB L SB	Decoction Paste Decoction	Dysentery Spider bite, burn and abscesses Dirrhoea
22. <i>Terminalia catappa</i>	Indian almond	<i>Combretaceae</i>	SB L L and SB	Decoction Decoction Decoction	Ulcer Hepatitis Antidiabetic
23. <i>Diospyros mespiiiformis</i>	Jackal berry	<i>Ebeneceae</i>	L L	Decoction Powder	Body pain Chicken pox
24. <i>Borasusaethiopum</i>	African fan palm	<i>Arecaceae</i>	R	Decoction	Asthma
25. <i>Lannea acida</i>	Plum mango	<i>Anacardiaceae</i>	SB L	Decoction	Dysentery Anti dirrhoea

Table 2: Medicinal uses of surveyed plants. Cont.....

S/N. Botanical	Common Name	Family	Part(s) Used	Mode preparation	Medicinal Uses
26. <i>Balanitesaegyptiaca</i>	Desert date	<i>Balanitaceae</i>	SB L	Decoction Decoction	Dysentery Yellow fever, Typhoid, Stomach ache and dysentery
27. <i>Psidium guajava</i>	Guava	<i>Myrtaceae</i>	SB R L	Decoction Decoction Concoction	Dirrhoea Dysentery Ulcer
28. <i>Detarium microcarpum</i>	Tallow tree	<i>Fabaceae</i>	L	Decoction	Menstrual pain and Stomach ache
30. <i>Bombax buonopolense</i>	Red silk / cotton tree	<i>Bombacaceae</i>	SB	Decoction	Sleeping sickness and Malaria

KEYS: **S** = Seed, **SB** = Stem bark, **R** = Root, **Fr** = Fruit, **Fl** = Flower, **WP** = Whole plant and **L** = leaves

3.0 DISCUSSION

Although ancient ages through trial and error methods have developed herbal medicines, the reported uses of plant species do not certify their efficacy (Rout, et al., 2009). Reports on ethno medicinal uses of plant species require pharmacological screenings, chemical analyses, and tests for their validity (Prance, G. T, et al., 2011). This study provides information on 30 medicinal plants belonging to 17 families that are most commonly used for traditional medicine. Some of the plants revealed in the survey have been cited in the ethnobotanical survey of some African countries, for example in the treatment of measles, jaundice, yellow fever, chicken pox and anti-malaria (Oladunmoye, et al., 2011). And the medicinal uses of the species (*Parkia biglobosa*) were the most diversified. Particularly, the digestive system diseases (diarrhoea, dysentery, abdominal pain), diseases of the cardiovascular system, wounds, pains and burns, infectious diseases (malaria, abscesses, yellow fever, measles) are reported (Kayode *et al.*, 2008). This study agreed with most of the literatures cited, so documentation of this kind of information will be beneficial in general health care, ecological control, forest conservation, research and provide useful information on medicinal plants.

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