

Full Length Research Paper

Ethnobotanical study of medicinal plants used by the Laniba village people in South Western Nigeria

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An ethnobotanical survey on medicinal plants used for treating and managing different ailments by the Laniba people who live in south western Nigeria was undertaken. The study was conducted using unstructured interviews among both male and female herbalists, herb sellers and experienced village elders. Information on traditional uses and remedies were documented. Twenty-one plants belonging to fifteen families were mentioned by herbalists and villagers as being commonly used. Interview data suggested a heterogeneous use of medicinal plants. *Dioscorea hirtiflora* Benth., *Piper guineense* Schumacher and Thonn., *Allium* L. species, *Citrus aurantifolia* (Christm.) Swingle were prominent in the recipes, which suggested that they are important in the management of diseases. Most of the plants identified in this study have been previously experimentally verified as being active biologically. The family Liliaceae occurred most frequently in the list. This work includes the plant recipes, plant part used, mode of preparation and application of the remedies as specified by people of Laniba village.

Key words: Nigeria, medicinal plants, traditional knowledge, conservation.

INTRODUCTION

The use of plants as medicine to cure or prevent illness is a long standing culture in many communities of the world. Every society has a legacy of plant use in answer to many health problems. The earliest references to these medicinal plants as cure for diseases are found in the manuscript of the 'Eber papyrus', which contains 700 medical formulas and dating back to 16th century B. C. (Simpson and Ogorzaly, 1986). The African continent is particularly blessed with vast species of plants, which have both economic and medicinal importance. Research findings support the view that medicinal plants will probably continue to play an important role as health aid (Moermann, 1996; Hoareau and DaSilva, 1999). The use of medicinal plants constitutes an important part of traditional medicine, which is a part of African heritage. Though modern/orthodox medicine has improved the lot of many people worldwide, it is worthy of note that in many cultures, modern medicine compliments traditional practices as is obtainable in industrialized societies for example, China and India. In these societies, herbal

medicines have become more popular in the treatment of minor ailments and also on account of the increasing cost of personal health maintenance. Indeed, the market and public demand has been so great that there is a great risk that many medicinal plants today face either continuous rarity or imminent extinction.

In Nigeria, the majority of citizens use medicinal plants and visit traditional medicine practitioners for their health care needs. It was reported by Cunningham (1993) that in Nigeria, the ratio of Traditional Health Practitioners to the population was 1:110, while the ratio of medical doctors to the population was 1:16,400. This gives credence to the fact that people patronise Traditional Medical Practitioners (TMPs) for their primary healthcare needs more than orthodox medical doctors. Various workers have expressed the abundant presence and utilization of many medicinal plants in Africa (Sofowora, 1982; Gbile et al., 1990; Cunningham, 1993; Kokwaro, 1993; Getachew and Shiferaw, 2002; Soladoye et al., 2005; Gidey, 2010). Nigeria with her position as one of the important countries in West Africa is tremendously blessed with vast diversity of plants most of which are medicinal. However, unsustainable harvesting of these genetic resources as a result of irrational and uncontrolled exploitation by all people, groups has

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endangered many species while some of them are left with consequent threat of imminent extinction (Soladoye and Sonibare, 2003). This has been pointed out in several ethnobotanical studies conducted in different communities in Nigeria and other African countries (Sonibare and Gbile, 2008; Sonibare et al., 2009; Idowu et al., 2010; Mavundza et al., 2011). It is important therefore to document knowledge about medicinal properties of these plants as well as source indigenous knowledge from those that are the custodians of such for posterity sake. The present survey was carried out to document the indigenous knowledge possessed by the people in Laniba village in the use of medicinal plants for treatment of diseases and to stimulate sustainable harvesting that is necessary for their conservation.

MATERIALS AND METHODS

Study area

The survey was conducted in Laniba village of Akinyele local government area of Oyo state, one of the eleven in Ibadan metropolis (Oyo State) with its headquarters in Moniya. Laniba village is one of the twelve wards in the local government area. The study area lays in the rain forest zone of Nigeria within latitude 6°15' and 6°50'N, and longitude 3°40' and 4°45'N. In the area, rainfall pattern is bimodal with peaks in May and August. There is a distinct period of dryness between November and February. The rainfall pattern allows for practices in humid zone, the slash and burn techniques followed by fallow period. Majority of the inhabitants grow arable crops and staple crops. The climax vegetation is semi-deciduous forest with humid to sub-humid tropical climate. Laniba village is dominated by the Yorubas among which are Christians and Muslims and Traditional Practitioners. The major occupation of the inhabitants includes: Agriculture, trading, food processing but primarily agriculture. In Laniba village, there is no primary health care sector; TMPs are the only source of providing health care to the villagers. This invariably brings medicinal plants to the focal point of daily usage, which has placed them under perpetual harvesting with consequent risk of imminent extinction. This trend would have serious damaging effect on the flora of this area if no drastic measure is taken to arrest the situation. The study was therefore undertaken to evaluate some of the medicinal plants used in the village in managing and treating various disease conditions as a means of assessing the indigenous knowledge of the inhabitants of Laniba village in the use of medicinal plants.

Data collection

After satisfying the ethics requirement for the study, several field trips were made to the study centre between March and November 2010 with the aim of collecting plants of ethnobotanical value and documenting the indigenous practices of the people of Laniba village. Prior information was obtained from village heads on potential informants with useful knowledge of medicinal plants use in the villages. Based on their recommendation, Imams, hunters, herbalists, traditional medical practitioners and experienced village elders (male and female) were interviewed by means of semi-structured interviews. This was used because it enabled an informal conversation with the villagers, which eventually allowed for individual differences and made room for a better probe into the indigenous knowledge possessed by the people. Moreover, well

structured questionnaires were un-useful in this community with a handful number of literate people. The only way to get out information from the people was the informal setting made possible through the use of the semi-structured interview. The interviews examined the various plant species, recipes and their administrations in the treatment of various ailments. Data collected were the local names of plants used, disease for which plant is used, specific plant parts, use of incantations if any, their uses and methods of preparation, mode of administration, area of collection, method of preservation and year of experience of the respondent. In most cases, the vernacular names of the plants were given by the herbalists and villagers. Some research journals and textbooks were consulted for the verification of the botanical names. Plant materials were identified and confirmed at Forest Herbarium Ibadan (FHI). Statistical methods were employed to access the frequency of distribution of the species and to know the distribution of major plant parts used in Laniba village.

RESULTS

A total of twenty-one plant species belonging to fifteen different families were collected as parts of the plants used for the management and cure of different ailments reported in Laniba village. Nine recipes were given by herbalists. The summary of the names of the medicinal plants, their families, parts that are used, their local names and medicinal applications is given in Table 1. Number of occurrence of different species is shown in Table 2. It was observed that some families occurred more than once, while some occurred up to two to three times in the prescriptions. Major plant parts used are leaves, corms, seeds and rhizomes (Figure 1). Roots, stem bark and flowers were also found in the recipes. These were usually collected from the forest, farmlands, backyards, road side bushes, and market places. These plant parts were preserved by cutting into pieces and then sun-dried or kept in the ceiling or house sheds. They were sometimes hung in the kitchen area or fire places where they are exposed to constant heat that dries them up gradually in order to reduce moisture content. Some are sometimes ground into powder and preserved for future uses. Hygienic collection was ascertained by using well-kept machetes and knives for harvesting. From the responses of people, it was observed that medicinal preparations are made by infusion, decoctions, tinctures, macerations, concoctions, powder and pastes. Prescriptions are enumerated along with the procedure of preparation and dosage. Mode of application was mainly oral while in some cases the remedies were administered topically.

Enumeration of recipes in treatment of various ailments

Hypertension

Allium cepa and *Allium sativum* are cut into pieces and macerated in water for about three days. The liquid extract is to be taken three times daily.

Table 1. Medicinal plants used for common ailments in Laniba village.

Botanical name	Family	Local name	Plant part used	Medicinal application
<i>Aframomum melegueta</i> K. Schum.	Zingiberaceae	Atare	Fruit	Problematic pregnancy
<i>Allium ascalonicum</i> L.	Liliaceae	Alubosa elewe	Whole herb	Gonorrhoea and low sperm count
<i>Allium cepa</i> L.	Liliaceae	Alubosa	Fruits	Anti-gonorrhoea and hypertensive agent
<i>Allium sativum</i> L.	Liliaceae	Aayu	Fruits	Anti-gonorrhoea and hypertensive agent
<i>Borreria verticillata</i> (L.) G. Mey.	Rubiaceae	Irawo-ile	Whole herb	Low sperm count and weak erection
<i>Caladium bicolor</i> (Aiton) Vent.	Araceae	Ewe eleje	Leaves	Conquering enemies
<i>Chrysophllum albidum</i> G. Don.	Sapotaceae	Agbalumo	Seeds	Cholera
<i>Citrus aurantifolia</i> (Christm.) Swingle	Rutaceae	Bitter orange	Fruits juice	Cholera and Gonorrhoea
<i>Cucumis melo</i> L.	Cucurbitaceae	Bara	Fruits	Stomach ache and dysmenorrhoea
<i>Dioscorea dumetorum</i> (Kunth) Pax	Dioscoreaceae	Esuru gudugudu	Tubers	Boil, jaundice and conquering enemies
<i>Dioscorea hirtiflora</i> Benth.	Dioscoreaceae	Isu- ahun	Tubers	Gonorrhoea, dysmenorrhoea and antimicrobial agent
<i>Elaeis guineensis</i> Jacq.	Palmae	Epo eyin	Seeds	Antimicrobial agent and a coolant
<i>Ficus sur</i> Forssk.	Moraceae	Igi-opoto	Fruits	For wound, antimicrobial agent and tonic
<i>Morinda lucida</i> Benth.	Rubiaceae	Ewe oruwo	Leaves	Anti-malaria
<i>Musa sapientum</i> L.	Musaceae	Ogede-wewe	Inflorescence	Problematic delivery
<i>Piper guineense</i> Schumacher and Thonn.	Piperaceae	Iyere	Seeds	Memory enhancer, problematic delivery, low sperm count, weak erection
<i>Sebastiania chamaelea</i> (Linn.) Mull. Arg	Euphorbiaceae	Atikekere wu eyin	Leaves	Problematic delivery
<i>Talinum triangulare</i> (Jacq.) Willd.	Portulacaceae	Etigure	Leaves	Antimicrobial agent
<i>Vitellaria paradoxa</i> G. Don.	Sapotaceae	Ori/Shea butter	Seeds	Antimicrobial agent, coolant
<i>Xanthosoma sagittifolium</i> (L.) Schott	Araceae	Koko	Tuber	Conquering enemies
<i>Zea mays</i> L.	Poaceae	Omi Ogi	Fruits	Anti-gonorrhoea

Boil

(i) Fresh leaves of *Talinum triangulare* is grounded with *Vitellaria paradoxa* and *Elaeis guineensis* and applied topically to the affected part.

(ii) Roasted *Dioscorea hirtiflora* is grounded and mixed with potash and drunk with hot pap (from *Zea mays*).

(iii) Roasted *D. hirtiflora* is grounded into powder form and made into ointment by mixing with *V. paradoxa*. The preparation is applied topically on the affected area.

Cholera

Crushed seeds of *Chrysophllum albidum* is soaked in juice of *Citrus aurantifolia* and alcohol in a covered jar and left for days. A small tumbler-full of the extract is taken after fellow is instructed not to take any food until after waking up from sleep.

Low sperm count

(i) Tortise shell; head of male lizard and black soap are grounded together. The affected part is

bath with the mixture twice daily.

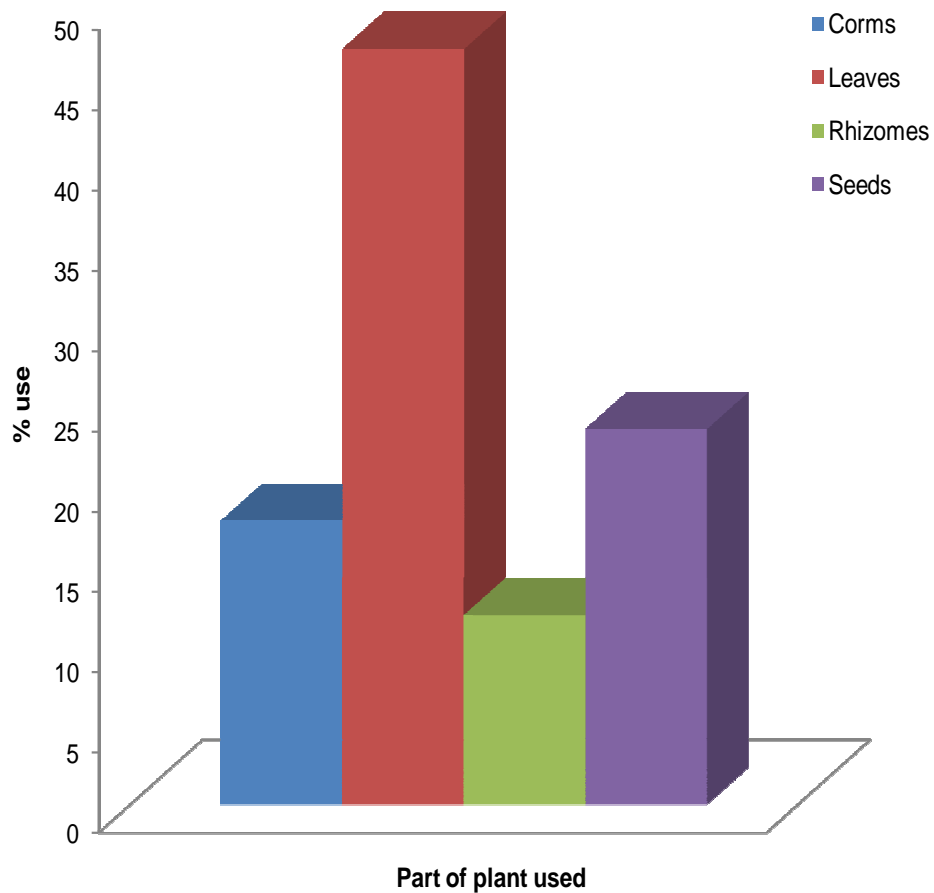
(ii) Tortise shell, *Borreria verticillata*, *Allium Ascalonicum* and *Piper guineense* are grounded together and cooked with snail. The preparation is taken as soup.

Problematic pregnancy and delivery

(i) Inflorescence of *Musa sapientum* and seeds of *P. guineense* are grounded together and cooked with wholesome rat to make a soup. The woman with a hard labour is to take the rat wholly from

Table 2. Species distribution according to ethno botanical survey.

Species	Number of occurrence
<i>A. melegueta</i> K. Schum.	1
<i>A. cepa</i> L.	1
<i>A. sativum</i> L.	2
<i>B. verticillata</i> (L.) G. Mey.	1
<i>C. bicolor</i> (Aiton) Vent.	1
<i>C. albidum</i> G. Don.	1
<i>C. melo</i> L.	1
<i>D. dumetorum</i> (Kunth) Pax	1
<i>D. hirtiflora</i> Benth.	5
<i>E. guineensis</i> Jacq.	1
<i>F. sur</i> Forssk.	1
<i>M. lucida</i> Benth.	1
<i>M. sapientum</i> L.	1
<i>P. guineense</i> Schumacher and Thonn.	3
<i>S. chamaelea</i> (Linn.) Mull. Arg	1
<i>T. triangulare</i> (Jacq.) Willd.	1
<i>V. paradoxa</i> G. Don.	2
<i>X. sagittifolium</i> (L.) Schott	1
<i>Z. mays</i> L.	2

**Figure 1.** Percentage use of major plant parts in folk medicine in Laniba.

head to tail before sleeping in the night.

(ii) Ori-ofafa is burnt with *Aframomum melegueta* and kept. When a woman is in hard labour, she is given as a powder on her palm to lick. As soon as she takes it, she shall deliver.

(iii) Fresh leaves of *Sebastiana chamaelea* and little seeds of *P. guineense* are milled together and the mixture cooked into soup. When pregnancy is problematic, the woman is asked to lick the soup. It is also recommended for all pregnant women to always take it once a while for easy delivery.

Yellow fever

The fresh leaves of *Morinda lucida* are milled with soap. The mixture is used to wash only the head and neck region of the affected person.

Dysmenorrhoea

Peeled fruits of *Cucumis melo* are cut into pieces, *D. hirtiflora* is also peeled and cut into pieces, a handful of potash is added to it in a jar and then soaked in alcohol for some days. One small tumbler-full is taken without eating before the menstrual flow starts. If the symptoms persist, the drug is to be continued throughout the menstrual period.

Gonorrhoea

If acute, *D. hirtiflora* is peeled, sliced, dried and grounded into powder; it is then mixed with lime (*Citrus aurantifolia*). One table spoon is taken daily.

If the Gonorrhoea is chronic, three long syringes are injected into three tubers of *D. hirtiflora*, the preparation is then boiled with pap (From *Zea mays*) water, *A. ascalonicum* and *A. sativum*. Small tumbler-full of the infusion is to be taken daily.

Conquering enemies

Fresh tubers of *Dioscorea dumetorum* (non-edible), *Xanthosoma sagittifolium*, leaves of *Caladium bicolor* and black soap are milled together and bathe with in a flowing river.

DISCUSSION

The ethnobotanical survey of plants used for the treatment and management of various illnesses, which was undertaken at Laniba village of Akinyele local government area of Oyo State, revealed that the villagers

of Laniba use herbal medicines as their main source of health care. The Lanibas are seen from this study as being versatile and skilful in the use of herbal medicine. The study site is noted as rich in species diversity thus, confirming the observation of Kasperek (1997) that medicinal plants constitute the largest category of biodiversity used by the people. Plants have been reported to be almost the exclusive source of drugs for the majority of the world's population (Farnsworth and Bingel, 1997; Odetola and Bassir, 1986; Okogun, 1994); we are in a way providing another proof to this claim through the Laniba survey. The sexes and number of people that were involved confirmed a heterogenous pattern of botanical resource use, knowledge and value within the community.

The year of experience and the health standard provided support for the practice of traditional medicine in the village. Respondents disclosed that medicinal plants are either purchased from local markets or collected from nearby forest and bushes for healthcare delivery. This is in agreement with the observation of Fajinmi and Taiwo (2005) that herbal therapies are natural products, environmentally friendly and cheap. However, this attitude of plant collection from the forest and bushes if not checked may lead to irrational plant collection that may endanger some of the important medicinal plants or bring about their eventual extinction. Other risks involved in this include collection of plants from polluted sites and mis-identification of plants. To a very large extent the environment where plants are collected contributes to the types and nature of metabolites present in the plants that may render any medicinal usefulness. There should therefore be awareness on proper or sustainable plant collection in which cultivation of some of the medicinal plants is encouraged. It should be noted that prescriptions given did not include any form of incantations. Recipes were majorly herbs (38.1%), shrubs (28.6%) and trees (23.8%). The most used plant parts are leaves (47.1%), seeds (23.4%) and the least are corms (17.7%) and rhizomes (11.8%). Preparation of powders from plant materials formed the most common method of preparation while the least was decoction. The preferences in mode of preparation was said to be dependent on potency and shelf life of remedies.

Recipes collected were reported to have been used for the treatment of common ailments which include: Hypertension, low sperm count and weak erection, fevers, boils, problematic pregnancy and delivery, dysmenorrhoea and gonorrhoea. Most of the plants in these recipes have been investigated for possible bio-activity in previous studies by various workers. For instance, *A. cepa* is an antimicrobial agent as reported by the people of Laniba. It was reported by Oliver-Bever (1980) that extracts of *A. cepa* have shown bacteriostatic and hypoglycaemic activity. Externally onion is used as a rubefacient and anti-phlogistic on abscesses (Watt and Breyer-Brandiwijk, 1962). The folk medicinal uses of *A.*

sativum are well documented. It is commonly put into cough medicine, and as stomachic added to gruel millet taken as a drink. It is similarly used for fevers with chills. A cold infusion serves as a body wash for infants for protection against chills. It is also used against rheumatism, bronchitis, typhoid, tuberculosis and quickens the circulation (Burkill, 1985). This is also in line with the usage by the Lanibas as it is to them a hypotensive agent. *P. guineense* is used in the treatment of problematic delivery, low sperm count and weak erection that is, associated with treatment of reproductive system. It was also reported traditionally in Congo that cooked leaves or decoction of *P. guineense* is taken for menstrual troubles and is administered generally to cleanse the abdominal region of women. For men, these preparations are held to be aphrodisiac and a pelvic decongestant in chronic gonorrhoea. When taken with food, it improves the chance of conception (Burkill, 1997). In Nigeria, leaves are taken in soup by women to assist in child birth. Leaves are used for their antiseptic and revulsive properties. Cooked or in decoction for headache, toothache and lumbar pains in Congo. The sap is inhaled into the nose for headache or used as a mouth wash for mouth and throat infections in Ivory Coast. A root decoction is administered in Ivory Coast as diurectic, aphrodisiac, anti-diarrhoeic as well as anti blennorrhagic (Burkill, 1997).

It was gathered from the survey that traditional medicine practitioners remain in the business because of cheap source of livelihood. It is evident that medicinal plants apart from playing an important role in the health care of developing countries as typified by the people of Laniba in south-Western Nigeria, they are also important economically. The easy accessibility to plant parts such as roots, barks, leaves and flowers, which are collected from the forest around the neighbourhood, along roadsides and sometimes market places plays a significant role in further sustaining the interest of the villagers in the practice of traditional medicine. However, a great concern is the issue of sustainability. The use of medicinal plants in preventive and curative condition is not new (Joshi and Edington, 1990; Eddouk et al., 2002; Tapsoba and Deschamps, 2006; Artherton et al., 2008) but the fact that these plants are being over collected and also irrationally is of major concern worthy of attention. There are many reports of unsustainable harvesting of various medicinal plants in different communities in Africa and other continents of the world (Hamilton, 2004; Soladoye et al., 2005). The experience in Laniba village was not different. This was evidenced by the responses of certain local users of these plants who lamented on the problem encountered in finding some of the herbs at localities where they previously existed. This might be an indication of the fast disappearance of these plants, which may lead to their eventual extinction if there is no drastic measure in place to curb this.

In order to have a considerable long term effect on the

environment, healthcare and economy, the use of important medicinal plants in a way and a rate that does not threaten or endanger the plants must be ensured (Wong et al., 2001). The utilisation and conservation of important medicinal species must be the focus of all plant users (Sheldon et al., 1997; Harnischfeger, 2000; Hamilton et al., 2000). Lack of conservation will only lead to an increase in the number of endangered species and it will eventually result in extinction, which is the gradual but sure elimination of taxa. In our group, our experience in research focused on medicinal plants conservation; points out that several plants of social economic values as well as plants that are regarded as sacred are associated with traditional healing. With these great potentials of medicinal plants to alleviate major health problems in human and the increased realization that some wild species are being over-exploited as is the case in Laniba, the need has arisen to pay a closer attention to the issue of conservation. As a matter of fact, a number of agencies are recommending that wild species be brought into cultivation systems to forestall their eminent extinction. Extensive cultivation of these medicinal plants should therefore be an urgent task by all stakeholders if we will have some of them to fall back on in the nearest future (Sonibare et al., 2009).

Conclusion

The results of our study provide the enumeration of twenty-one plants employed for various therapeutic uses in Laniba village. The people living in this village possess vast traditional knowledge about plants, which makes them to rely on medicinal plant used to solve most of their health problems ranging from cholera, low sperm count to gonorrhoea. However some of these plants are being over exploited without adequate measures on ground for their replacement. There is therefore, need to educate the local populace who are by far the greatest users of medicinal plants on effective means of sustainable harvesting and conservative measures. The collection, identification and documentation of the medicinal plant species encountered in our study are parts of the primary steps in their conservation. The present work is therefore providing a basis for the continued effort geared at future drug discovery from indigenous medicinal species with an emphasis on the need for conservation policy on indigenous medicinal plants in Laniba village.

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REFERENCES

- Artherton DJ, Sheehan MP, Rustin HA, Whittle B, Guy G (2008). Treatment of atopic eczema with traditional Chinese medicinal plants. *Pediatr. Dermatol.*, 9(4): 373-374.
- Burkill HM (1997). The useful plants of West Tropical Africa, 4: 437-439.
- Burkill HM (1985). The useful plants of West Tropical Africa. Royal Botanic Gardenes Kew. 2nd edit. (1) Families A-D. pp. 228-599.
- Cunningham AB (1993). African medicinal plants: Setting priorities at the interface between conservation and primary Health Care. Working paper 1, WWF/UNESCO/Kew. People and plants initiative, Paris, France; UNESCO, p. 92.
- Eddouk M, Magahrani M, Lernhadri A, Quahldi ML, Jouad H (2002). Ethnopharmacological survey of medicinal plants used for the treatment of diabetes mellitus, hypertension and cardiac disaese in South east region of Morokko (Tafleti). *J. Ethnopharmacol.*, 82: 97-103.
- Fajinmi AK, Taiwo AA (2005). Herbal remedies in animal parasitic diseases in Nigeria: *Rev. Afr. J. Biotechnol.*, 4(4): 303-307.
- Farnsworth NR, Bingel AS (1997). New natural products and plant drugs with pharmacological and biological therapeutic activity In Wagner H. and Wolff, P. (eds.), Springer NY., pp. 61-63.
- Gbile ZO, Adeyemi FA, Odewo TK (1990). Nigeria flora and its pharmaceutical potential In: Baijnah, H, Ceck M, Hepper F N, Lejoly J, Lucas G L, Malaise FP, Peters CR, Wassels DC, J. (Eds). Proceedings of the 12th Plenary meeting of Aetifat. Hamburg Mitteilengen aus dem Institute fur Allgemeine Botanik, Hamburg 23b, pp. 1033-1046.
- Getachew B, Shiferaw D (2002). Medicinal Plants in Bonga Forest and Their Uses. *Biodiversity Newsletter* 1: 9-10 IBCR Addis Ababa.
- Gidey Y (2010). Use of traditional medicinal plants by indigenous people in Mekele town, capital city of Tigray regional state of Ethiopia *J. Med. Plants Res.*, 4(17): 1799-1804.
- Hamilton AC, Cummingham A, Byarugaba D, Kayanja F (2000). Conservation in a region of political instability. *Conserv. Biol.*, 14: 1722-1725.
- Hamilton AC (2004). Medicinal plants, conservation and livelihoods. *Biodivers. Conserv.*, 13: 1477-1517.
- Harnischfeger G (2000). Proposed guidelines for commercial collection of medicinal plant material. *J. Herbs, Spices Med. Plants*, 7: 43-50.
- Hoareau L, DaSilva EJ (1999). Medicinal Plants: A Re-emerging Health Aid. *Electr. J. Biotechnol.*, 2: 56-70.
- Idowu OA, Soniran OT, Ajana O, Aworinde DO (2010). Ethnobotanical survey of antimalarial plants used in Ogun State, Southwest Nigeria. *Afr. J. Pharm. Pharmacol.*, 4(2): 55-60.
- Joshi AR, Edington JM (1990). The use of medicinal plants by two village communities in central development region of Nepal, *Econ. Bot.*, 44: 71-83.
- Kasperek M (1997). African Network on medicinal and aromatic plants (ANIUMAP) founded at Abuja Nigeria. *Med. Plants Conserv.*, 4: 18.
- Kokwaro JO (1993). Medicinal plants of East Africa, Second Edit. University of Nairobi.
- Mavundza EJ, Maharaj R, Finnie JF, Kabera G, Van Staden J (2011). An ethnobotanical survey of mosquito repellent plants in uMkhanyakude district, KwaZulu-Natal province, South Africa. *J. Ethnopharmacol.*, 137: 1516-1520.
- Moermann DE (1996). An analysis of the food plants and drug plants of Native North America, *J. Ethnopharmacol.*, 52: 1-22.
- Odetola AA, Bassir O (1986). Evaluation of anti-malaria properties of some Nigeria medicinal plants In: Sofowora E. A. (ed.) The State of medicinal plant research in Nigeria. Ibadan University press Nig., pp. 275-284.
- Okogun JI (1994). On earth plants are necessary for life: the case of neem tree *Azadirachta indica* A. Juss. *National Institute for Pharmaceutical Res.Devel. Nig. Bulletin*, 3: 17-20.
- Oliver-Bever B (1980). Oral hypoglycaemic plants in West Africa. *J. Ethnopharmacol.*, 2: 119-127.
- Sheldon JW, Balick MJ, Laird SA (1997). Medicinal plants: can utilization and conservation coexist? *Advan. Econ. Bot.*, 12: 1-104.
- Simpson BB, Ogorzaly MC (1986). *Econ. Botany: plants in our world.* McGraw-Hill, Inc. NY., p. 640.
- Sofowora EA (1982). *Medicinal Plants and Traditional Medicine in Africa.* Wiley, NY., p. 256.
- Soladoye MO, Sonibare MA (2003). Non-timber forest products of Old Oyo national park and their sustainability. *Nigerian J. Bot.*, 16: 16-32.
- Soladoye MO, Sonibare MA, Nadi AO, Alabi DA (2005). Indigenous Angiosperm biodiversity of Olabisi Onabanjo University Permanent site. *Afr. J. Biotechnol.*, 4 (5): 554-562.
- Sonibare MA, Gbile ZO (2008). Ethnobotanical Survey of anti-asthmatic in South Western Nigeria. *African J. Trad. Comp. Alt. Med.*, 5(4): 340-345.
- Sonibare MA, Moody JO, Adesanya EO (2009). Use of medicinal plants for the treatment of measles in Nigeria. *J. Ethnopharmacol.*, 122: 268-272.
- Tapsoba H, Deschamps JP (2006). Use of medicinal plants for the treatment of oral diseases in Burkina Faso. *J. Ethnopharmacol.*, 104: 68-78.
- Watt JM, Breyer-Brandiwijk MG (1962). *The medicinal and poisonous plants of southern and eastern Africa.* Ed. 2, Edinburgh and London Livingstone.
- Wong JLG, Thornber K, Baker N (2001). *Resources Assessment of Non-wood Forest products.* FAO Rome, Italy. p. 118.