Journal of Biological Sciences and Bioconservation
Volume 10, Number 3, 2018
ISSN: 2277-0143

A SURVEY AND IDENTIFICATION OF SOME FOREST PLANTS USED AGAINST BACTERIAL AND FUNGAL DISEASES IN ABEOKUTA METROPOLIS, OGUN STATE, NIGERIA

Afuape, A.O.
Department of Science Laboratory Technology
Moshood Abiola Polytechnic, Abeokuta, Nigeria.
Email: Afuape.abolaji@mapoly.edu.ng

ABSTRACT

Several plants have been used for management of bacterial and fungal diseases. An ethnobotanical survey of plants often used for treatment of common bacterial and fungal diseases in Abeokuta metropolis of Ogun State was carried out. Structured questionnaire was used to elicit information on the selected plants based on frequency of mention from 200 purposively selected herbal product sellers and Practitioners in Abeokuta North and South Local Government Areas of Ogun State, Nigeria. Quantitative phytochemical screening of secondary metabolites of most frequently mentioned plants including *Daniellia oliveri,Terminalia avicennoides, Garcinia kola, Ocimum gratissimum and Lawsonia inermis* was carried out to determine the concentrations of tannins, saponin, steroids, flavonoids, alkaloid, phenol, terpenoid, anthocyanin and anthraquinone on the plant extracts using ethanol, CSL and water as solvent for extraction. Ninety-two plants species belonging to fifty families used for treatment of some bacterial and fungal infections were recorded out of which 65.2% were tree species and *Daniellia oliveri* H&D. (13.03%)had the highest percentage of occurrence. Decoction was the predominant mode of preparation and mostly administered orally. The percentage of prioritized plants were

Daniellia oliveri (13.03%),Terminalia avicennoides Guill.& Perr.(8.99%), *Garcinia kola* Heckel (5.60%), *Ocimum gratissimum* Linn.(5.34%) *and Lawsonia inermis* Linn.(4.17%*).* The most exploited plant parts was stem bark (38.6%).Ethanol extracts of *O. gratissimum* leaves recorded highest tannin, alkaloid, flavonoid and phenol values of 12.53 ± 0.08 mg/ml; 0.910 ± 0.010 mg/ml; 0.765 ± 0.015 mg/ml and 0.805 ± 0.005 mg/ml respectively when compared with its aqueous extract. Ethanol extract of *D. oliveri* stem bark recorded highest tannin, alkaloid, flavonoid and phenol contents 9.590 ± 0.010 mg/ml; 0.865 ± 0.015 mg/ml, 0.310 ± 0.010 mg/ml and 0.165 ± 0.005 mg/ml respectively. The study revealed that ethanol extract of *O.gratissimum* leaves had higher phytochemical constituents when compared with other plant studied.

Keywords: *Phytochemical, Extracts, Decoction, Bacteria, Fungi.*

INTRODUCTION

Ethnobotany is the study of how the people in communities of a particular region employ indigenous plants for food, clothing, medicine and other activities (Aiyeloja and Bello, 2006). The documentation of ethnobotany is crucial to the conservation and utilization of biological resources (Muthu *et al.,*2006). The continuous search for natural plant products for use as medicines is encouraged by ethnobotanical survey. According to Igoli *et al.,* (2005) ethnobotanical survey is one of the major approaches for selecting plants for pharmacological screening. Plant materials have been a major source of natural therapeutic remedies and are used to treat various infectious diseases in many developing countries including Nigeria (Ody,1993). Natural products of plant sources have been the

centre of focus as the main source of new, safer and more effective bioactive compounds with medicinal properties (Nitta *et al.,* 2002). A vast majority of prescription drugs used in the world contain compounds that are directly or indirectly, via semi-synthesis, derived from plants (Oksman-Caldentey and Inze, 2004). Thus, plants continue to be very important resources for new medicines and beneficial compounds.

Knowledge of plant secondary metabolites has increased botanical knowledge as a promising instrument in bio-prospecting of useful plants for human and animal medicines (Lawal *et al.,* 2009). The medicinal values of these plants lie in the content of some chemical substances that produced a definite physiological action on the human body (Timo *et al.,* 2013). The important bioactive constituents of plants are alkaloids, tannins, flavonoids and phenolic compounds (Timo *et al.,* 2013). Saponin and Flavonoids which were present in high concentration in some of the plants e.g *Lawsonia inermis* have been reported to form complexes with cholesterol and bile in the intestine thereby indirectly reducing the cholesterol and sugar level in the blood (Ojewumi and Kadiri, 2014). The presence of alkaloids in significant quantities makes the plant useful as antimalaria, analgesic and stimulant according to Yahaya *et al.* (2011). The presence of steroid in *Daniellia oliveri* makes the plant useful in the treatment of some skin infections like ringworm as reported by Raquel (2007). Many Nigerians are beginning to make use of herbs and herbal products in the treatment of diseases due to the fact that these plants are cheap and readily available in our immediate environs and those conventional drugs may result in unpleasant

side-effects and possibly become ineffective over time (Ojewumi and Kadiri, 2014).

Therefore, this research aimed to describe the socio-economic characteristics of the respondents, identify and categorize forest plants used in local treatments of some bacterial and fungal infections in Abeokuta metropolis, find from respondents mode of administration and carry out phytochemical screening of the most frequently used plants in treatments of some bacterial and fungal infections in Abeokuta metropolis of Ogun State, Nigeria.

MATERIALS AND METHODS

Study Area, consent and general questionnaire

The study was conducted in Abeokuta North and South Local Government Areas of Ogun State. The purpose of the study was explained to the herbal material sellers and herbal practitioners in the community. A consent for the study was also obtained from market and community leaders.

General questionnaire

Structured questionnaires were administered randomly to traditional herbal material sellers in markets and sales outlets. The questionnaire was in two parts; section A was made to address the socio-demographic characteristics of the respondents while section B focussed on the ethnobotanical information on forest medicinal plants being sold by the respondents.

Methods of study

Five (5) markets and sales outlets were randomly selected in each of the Local Government Areas, especially where herbal products/ materials are being sold.
In each market, twenty (20) plant herbal material sellers were randomly selected, this summed up to a total of one hundred (100) respondents in each Local Government Area and a sum total of two hundred (200) respondents in the whole study area.

QUANTITATIVE PHYTOCHEMICAL SCREENING

Phytochemical screening was carried out on hot water and ethanolic extracts of *Ocimum gratissimum* Leaves and *Daniellia oliveri* stem bark using standard procedures to identify the constituents as described by Odebiyi and Sofowora (1990).

Test for Phenols

The quantity of phenols was determined using the spectrophotometer method. The plant sample was boiled with 50 ml of diethyl ether for 15min. 5 ml of the boiled sample was then taken into 50ml flask, and 10 ml of distilled water was added. After the addition of distilled water, 2 ml of ammonium hydroxide solution and 5 ml of concentrated amyl alcoholis added to the mixture. The sample was made up to the mark and left for 30 min to react for colour development and measured at 505 nm wavelength using a spectrophotometer (Harbone, 1998).

Test for Alkaloids

Five (5) g of the plant sample were prepared in a beaker and 200 ml of 10% acetic acid in ethanol was added to the plant sample. The mixture was covered and allowed to stand for 4 hours. The mixture then filtered and the extract was allowed

to become concentrated in a water bath till it reaches 1/4 of the original volume. Concentrated ammonium hydroxide was added until the precipitation was complete. The whole solution was allowed to settle and the precipitate was collected and washed with dilute ammonium hydroxide and then filtered. The residue is alkaloid, which was then dried and weighed (Harbone, 1998).

Test for Tannins

Quantity of tannins was determined by using the spectrophotometer method. 0.5 g of plant sample was weighed into a 50 ml plastic bottle. 50 ml of distilled was added and stirred for 1 hour. The sample was filtered into a 50 ml volumetric flask and made up to mark. 5 ml of the filtered sample was then pipette out into test tube and mixed with 2 ml of 0.1 M ferric chloride in 0.1 M hydrochloric acid and 0.008 M potassium ferrocynide. The absorbance of the sample was measured with a spectrophotometer at 395 nm wavelength within 10 minutes (Harbone, 1998).

Test for Saponins

The plant samples were ground and 20 g of each plant sample was put into a conical flask and 100 ml of 20% ethanol was added to the plant sample. The sample was heated over a hot water bath for 4 hours with continuous stirring at about 55°C. The mixture was then filtered and the residue re-extracted with another 200 ml of 20% ethyl alcohol. The combined extracts are reduced to 40 ml over a water bath at about 90°C. The concentrated was then transferred into a 250 ml separating funnel and 20 ml of diethyl ether was added to the extract and vigorously shaken. The aqueous layer was recovered while the diethyl ether layer was discarded and the

purification process was repeated. 60 ml of n-butyl alcohol was added and the combined n-butyl alcohol extracts was washed twice with 10 ml of 5% sodium chloride. The remaining solution was then heated in a water bath and after evaporation; the samples are dried in the oven to a constant weight (Harbone, 1998).

Test for Flavonoids

Ten (10) g of plant sample is repeatedly extracted with 100 ml of 80% aqueous methanol at room temperature. The whole solution was then filtered through filter paper and the filtrate was later on transferred into a water bath and solution was evaporated into dryness. The sample was then weighed until a constant weight (Harbone, 1998).

Test for Steroids

One (1) ml of Methanolic extract of steroid solution was transferred into 10 ml volumetric flasks. Sulphuric acid(4N, 2ml) and iron (III) chloride (0.5% w/v, 2 ml), were added, followed by potassium hex cyanoferrate(III) solution (0.5% w/v, 0.5 ml). The mixture was heated in a water-bath maintained at 70±20°C for 30minutes with occasional shaking and diluted to the mark with distilled water. The absorbance was measuredat 780 nm against the reagent blank (Harbone, 1998).

Terpenoids

About 2 g of the plant powder was weighed and soaked in 50 ml of 95% ethanol for 24 hours. The extract was filtered and the filterate extracted with petroleum ether (60^0C) and concentrated to dryness. The dried extract was treated as total terpenoids (Harbone, 1998).

Anthocyanins

This was done gravimetrically by the method of Harborne (1998). Five (5) g of each test sample was hydrolyzed by boiling in 100ml or 2M Hydrogen Chloride solution for 30 minutes. The hydrolysate was filtered using Whatman No 42 filter paper. The filtrate was transferred into a separation funnel and equal volume of ethyl acetate was added to it, mixed well and allowed to separate into two layers. The ethyl acetate layer (extract) was collected while the aqueous layer was discarded. The extract was separated to dryness in the crucible over a steam-bath. The dried extract was then treated with concentrated amyl alcohol to extract the anthocyanins. After filtration, the alcohol extract and the filtrate was transferred to a weighed evaporating dish and evaporated to dryness. It was then dried in the oven at 300^0C (Harbone, 1998).

Anthraquinones

Borntrager's reaction was used to detect anthraquinoneaglycones in the extract. About 2ml of 2M hydrochloric acid was added to 8ml of the sample, and the mixture was heated on a hot water bath for 15 minutes, then cooled and filtered. The filterate was then extracted with chloroform. The chloroform layer was separated and shaken with 10% potassium hydroxidesolution. The total anthraquinone content was analysed by UV spectrophometer at 515 nm (Harbone, 1998).

RESULTS

Socio-economic characteristics of the respondents: Age and gender distribution of respondents revealed that out of the

total 200 respondents sampled, 155 were females representing 77.5% while the remaining 45 respondents were males representing 22.5%. The largest numbers of the respondents were reported in the age group of between 40 - 49 years. They were 49 in number representing 24.5% of the total. This was followed by the age group 30-39 years with 46 respondents representing 23.5% of the total. The least number of respondents is 4 (2.0%) who were in the age group of above 69 years of age (Table 1).

Marital, Religion and Education Status of the Respondents: In the area of marital status, the largest number of respondents were married, 127 in number representing 63.5% of the total, followed by singles, 51 in number representing 25.5% of the total,9.0% were divorced and only 2.0% were widowed (Table 1). In the area of religion, 50% or 100 of the respondents were Muslims, 83 representing 41% were Christians while 17 representing 8.5% were traditional worshippers. This revealed that religion is not a barrier in selling of herbal products. Eighty-two (82) respondents representing 41% with primary school education were the highest, followed by 50 (25%) respondents who had their education to secondary school level, 19% of the respondents had no formal education while 15% had tertiary education (Table 1).

Years of experience: the modal year of experience was observed to fall within 11-20 years. They were 91 in number representing 45.5% of the total. 69 representing 34.5% had below ten years of experience while 40 representing 20% of the total had been in the business of selling herbal product for more than twenty years (Table 1).

Sources of knowledge: the largest number of respondents had their knowledge of sale of herbal materials through inheritance; they were 79 in number representing 39.5% of the total, 64 representing 32% of the respondents obtained the knowledge through learning while 56 representing 28% of the respondents had the knowledge through interest.(Table 1). Annual income and household size of the Respondents : ten (10) (5%) of the respondents earned < 50,000 annually, 67 (33.5%) earned 50,000-100,000, 116 (58%) earned 100,001-150,000, which was the highest income annually, 5 (2.5%) earned 150,001-200,000 and 2 (1%) earned above 200,000 yearly. 69 (34.5%) had 1-3 people in their household, 99 (49.5%) had within 4-6 people in their household, 26 (13%) had 7-9 people while 6 (3%) had 10 people and above in their household (Table 1).

Summary of plant species exploited and used in the treatment of bacterial and fungal diseases in the study area: The details of plant species exploited for the treatment of bacterial and fungal diseases in the study area are presented in Table 2. Table 2a showed the taxonomic classifications of the plant species exploited in the study area. Ninety-two species belonging to fifty different families were recorded. A large number of the species (80) are cultivated or preserved either in farmlands or home gardens while 20 species were either cultivated or uncultivated (Table 2a). The detail of mode of preparation and administration of some plant species commonly used in the treatment of diseases in the study area were given in Table 2b. This table gives information on how the plant species were being used singly or in combination for the treatment of bacterial and

fungal diseases in the study area (Table 2b). The major plant species that are predominantly used for treating bacterial and fungal diseases were five in number, belonging to five families viz: Leguminosae; Lythraceae; Guttiferae; Labiatae and Combretaceae. These plant species cut across all the common bacterial and fungal diseases in the two Local Governments in the study area (Table 2c). The major parts of the plant species exploited included leaves, roots, stem bark, root bark, seeds and fruits. The most frequently used plant part was stem bark (78) representing 39% of the total species, followed by leaves which accounted for 66(33%) while root bark, fruit and seed were represented by 28(14%), 15(7.5%) and 13(6.5%) respectively (Figure 1). Figure 2 revealed the frequency of plants types commonly used as medicine in the study area. The plants belong to different life forms such as trees, shrubs, and herbs with trees species predominating numbering 60(65.2%) of total species. This was followed by the herbs which accounted for 17 species (18.5%) while shrubs had the least number of 15 species representing 16.3% of the total species (Figure2). The detail of mode of preparation of some plant species commonly used in the treatment of diseases in the study area was given in Figure 3. The most commonly used mode of preparation was decoction i.e boiling and this involved 94 species. This was followed by maceration involving 53 species. Other types of preparation used are topical, tincture and tisane involving 20, 18 and 15 species respectively (Figure 3).

Quantitative phytochemical screening of *Ocimum gratissimum* (Leave extract) and *Daniellia oliveri*(Stem bark extract): In *Ocimum gratissimum* and *Daniellia oliveri*, the phytochemical screening compounds (including steroids,

alkaloids, phenol, tannins, e.t.c.) were highest in ethanol extracts followed by CSL extracts and least was in aqueous extracts (Table 3). Steroid was highest in ethanol extract of *Ocimum gratissimum* leaves with 0.325 ±0.015 mg/ml and lowest in aqueous extracts of both *Ocimum gratissimum* and *Daniellia oliveri* with 0.160 ±0.010 mg/ml. It was observed that steroid contents of aqueous extract of both *Ocimum gratissimum* leaves and *Daniellia oliveri* stem bark was not significantly different ($p > 0.05$), also the steroid contents of corn steep liquor extracts of both plants were not significantly different ($p > 0.05$). Alkaloid was highest in ethanol extract of *Ocimum gratissimum* leaves with (0.910 ±0.010 mg/ml) and lowest in its aqueous extract. Ethanol extract of *Daniellia oliveri* stem bark recorded higher alkaloid content with (0.865 ±0.015 mg/ml). It was observed that alkaloid content of corn steep liquor of *Ocimum gratissimum* leaves and ethanol extract of *Daniellia oliveri* stem bark were not significantly different ($p < 0.05$). Phenol content was highest in ethanol extract of *Ocimum gratissimum* (0.805 ±0.005 mg/ml) and lowest in aqueous extract of *Daniellia oliveri* (0.105 ±0.005 mg/ml). Tannin was highest in ethanol extract of *Ocimum gratissimum* (12.525 ±0.075 mg/ml) and lowest in its aqueous extract. Ethanol extract of *Daniellia oliveri* had highest tannin content of 9.590 $\pm 0.010^{e}$ when compared with its aqueous extract (6.240 ±0.010 mg/ml). Tannin and phenol contents of all the extracts of both plants were significantly different ($p > 0.05$). Flavonoid was highest in ethanol extract of *Ocimum gratissimum* leaves (0.765 ±0.015 mg/ml) and lowest in aqueous extract of *Daniellia oliveri*(0.220 ±0.010 mg/ml). It was observed that the flavonoids content of all the extracts of both plants were significantly different ($p > 0.05$). Saponin was highest in

ethanol extract of *Ocimum gratissimum* leaves (2.325 ±0.025 mg/ml) and lowest in aqueous extract of *Ocimum gratissimum* (1.070 ±0.010 mg/ml). No significant different in the saponin content of aqueous extracts of both plants (p< 0.05). Terpenoid was highest in ethanol extract of *Ocimum gratissimum* leaves (0.200 ±0.010 mg/ml) and lowest in aqueous extract of *Daniellia oliveri* stem bark (0.100 ±0.010 mg/ml). There was no significant different in the terpenoid content of corn steep liquor and aqueous extracts of *Ocimum gratissimum* and corn steep liquor, aqueous and ethanol extracts of *Daniellia oliveri* (p < 0.05). Anthocyanin content was highest in ethanol extract of *Ocimum gratissimum* leaves (0.050 ±0.010 mg/ml) and lowest in aqueous extract of *Daniellia oliveri* stem bark (0.015 ±0.005 mg/ml). There was no significant different in the anthocyanin content of corn steep liquor, aqueous and ethanol extracts of both plants (p < 0.05). Anthraquinone content was highest in ethanol extract of *Ocimum gratissimum* leaves (0.315 ±0.005 mg/ml) and lowest in aqueous extract of *Daniellia oliveri* stem bark (0.145 ±0.005 mg/ml), the anthraquinone content of all the extracts of both plants were significantly different (p > 0.05).

DISCUSSION

The respondents' demographic characteristics of the Ethnobotanical survey of medicinal plants used in the treatment of some bacterial and fungal diseases in Abeokuta, Ogun State Nigeria indicated that gender is not a barrier in the sale of herbal products and use of plants. This was supported by the works of Abdulrahaman *et al*. (2009) who conducted a survey on the use of economic trees in Irepodun local government area of Kwara State, Nigeria. This study showed that 9% of the respondents were under age 20, 23%

were within the age group of 20-29 years, 23.5% were within 30-39years, while 44.5% were 40 years and above. This indicated that the younger age groups were more involved in the business of selling herbal products than the elderly ones. This attests to the findings of Kadiri*et al.* (2014) in a survey conducted on the use of plants in the management of Diabetes in Ogun State of Nigeria, he stated that 46% of the respondents (Herbal practitioners) were above 40 years .This implies that there will be no loss of information that has been acquired by our ancestors over the years. With respect to religion, 41.5% of the respondents were Christians, 50% were Muslims and traditional worshippers were 8.5%. This implies that religion is not a barrier in the sale and use of herbal products in Abeokuta . This was supported by the work of Mustafa *et al.* (2014); he conducted a survey on medicinal plants used in the treatment of Diabetes in Irepodun Local Government Area of Osun State. He stated that 80% of the respondents were Muslims. Most of the respondents interviewed had at least primary education, 65.5% had above 10 years of experience in selling herbal products, this shows that information obtained for this research can be reliable for further study. A good percentage of the respondents earn above #500,000 annually.

In this study, a total of 92 plant species belonging to 50 different families used for treatment of some bacterial and fungal diseases in Abeokuta metropolis were recorded. The most frequently used plant parts are stem bark and leaves and the best method of preparation was decoction. This was supported by the work of Kadiri *et al.* (2014) in his survey; he stated that 50% 0f plants collated from the survey was used as leaves suggesting that leaves may be richer in

phytochemicals than other parts and that the best method of preparation was decoction.

The most frequently mentioned plants were *Daniellia oliveri, Ocimum gratissimum, Lawsonia inermis, Garcinia kola and Terminalia avicennoides*. This may be due to the fact that these plants are readily available.Several investigations have been carried out by several researchers on the use of these plants. It was reported by Okwu (2003) that *Garcinia kola,* popular in South eastern Nigeria, is highly valued because of its medicinal use as the stem, root and bark serve as raw material for pharmaceutical properties.It was also reported by Usher (1984) that *Ocimum gratissimum* leaves are used in steam baths for the treatment of rheumatism while a decoction of it is used to treat venereal diseases. *Lawsonia inermis* was reported by Idowu *et al.* (2009) as one of the medicinal plants used in the treatment of fever in Ogun State. *Terminalia avicennoides* have been reported to possess antimicrobial activities (Abdullahi *et al.,* 2001; Akinside *et al.,* 1995; Akinyemi *et al.,* 2000; Mann *et al.,* 2008). Tony (2005) reported that the stem bark of *Daniellia oliveri* was used in the treating of fever, boil and back ache.

Tannin was the highest phytochemical observed in *Ocimum gratissimum* leaf for all extract concentrations. Anthocyanin were the lowest secondary metabolite observed in *Ocimum gratissimum* ethanol, aqueous and corn steep liquor extracts respectively. High tannin, saponin, flavonoid and alkaloid content in *Ocimum gratissimum* could make it useful in the treatment of diabetes. This was supported by Ojewumi and Kadiri (2014) who worked on the physiological evaluation of the anti-diabetic properties of *Morinda lucida* on rats. They

found these phytochemicals to be present and high in *Morinda lucida* which had a hypo-glycemic effect on rats. In vitro studies show that flavonoids also have anti-allergic, anti-inflammatory, anti-microbial (Cushnie, 2005), anti-cancer and anti-diarrheal activities (Shueir *et al.*, 2005). In vitro, flavonoids have antiviral activity against several viruses; among them is poliovirus (Gonzaiel *et al.,*1990). At very high concentration, flavonoids chelate metals such as iron and zinc and reduce the absorption of these nutrients. They also inhibit digestive enzymes and may also precipitate proteins. In one experiment, flavonoids were found to be strong topoisomerase inhibitors and induce DNA mutations in the MLL gene, which are common findings in neonatal acute leukemia (Strick *et al.,* 2000). High level of alkaloids exerts toxicity and adverse effects to humans, especially in physiological and neurological activities. For instance, consumption of tropane alkaloids will cause rapid heartbeat, least amount of alkaloid was observed in aqueous extract , this is supported by the fact that lower dose of alkaloids mediate important pharmacological activities, such as analgesic, reducing blood pressure, killing tumour cells, stimulating circulation and respiration . Saponins are effective in maintaining liver function, lowering blood cholesterol, preventing peptic ulcer, osteoporosis as well as platelet agglutination (Kao *et al.,* 2008). The beneficial effects of saponins have been applied commercially in drugs and medicines, emulsifiers, adjuvants, taste modifiers, sweeteners and precursors of hormone synthesis. Tannins have shown potential antiviral, antibacterial and antiparasitic effects (Akinyama *et al.,* 2001). It was also reported that certain tannin are able to inhibit HIV replication selectivity and is also used as diuretic. Plant tannin has been recognized for

their pharmacological properties and is known to make trees and shrubs a difficult meal for many caterpillars (Haslem, 1989).

Phenol was highest in ethanol extract of *Ocimum gratissimum* leaf. Phenols are reported antitumour agents and exhibit antiviral and antimicrobial activities, hypotensive effects and antioxidant properties (Egbuna *et al.,* 2015) Appreciable steroidal content of ethanol extracts of *Ocimum gratissimum* leaf (0.325 mg/ml) and that of *Daniellia oliveri* stem bark (0.225 mg/ml) explains the respondents' view of their use in the treatment of some skin infections like ringworm. Steroids have been reported by Raquel(2007)to have antibacterial properties and they are very important compounds especially due to their relationship with compounds such as sex hormones too (Okwu, 2001). Terpenoid which was found to be minimal in ethanol extract of *Ocimum gratissimum* leaf (0.200 mg/ml) have also shown antimicrobial activities (Islam *et al.*, 2003). This is important due to the increase in antibiotic resistant bacteria, which is occurring globally and at an alarming rate. In this study, ethanol extracts had higher quantity of phytochemicals than hot water extracts and this confirms that ethanol is a better extraction solvent than hot water. Arawande and Komolafe (2010) stated that as the polarity of a solvent increases so also does its extractive value increases; this implies that ethanol is more polar than hot water, thus the reason for its higher extractive value. This is because most of these plant chemicals (bioactive matter) are polar in nature and they are best extracted by polar solvents.

REFERENCES

Abdullahi, A.L., Agho, M.O., Amos, S., Gamaniel, K.S. and Wambebe, C.(2001). Antidiarrhoeal Activity of the Aqueous Extract of *Terminaliaavicennioides* Roots.*Phytotherapy Resource.*, 15: 431-434.

Abdulrahaman, A. A., Ihaza, O. C. and Oladele, F. A. (2009). A survey of Economic Tree and their Exploitation in Irepodun Local Government Area of p State, Nigeria. *Biological and Environmental Sciences Journal for the Tropics,* 6(1): 57-60.

Aiyeloja, A.A. and Bello,O. A. (2006). Ethnobotanical potentials of common herbs in Nigeria: A case study of Enugu state. *Educational Research and Review* Vol. 1 (1), pp. 16-22.

Akinside K.A, Olukoya D.K. (1995). Vibrocidal activities of some local herbs. *Journal of Diarhoeal. Disease Resources.* 13: 127–129.

Akinyama, M. K., Fujii, O., Yamasaki, T., Oono, K. and Iwatsuki.

(2001). Antibacterial action of several tannins against *Staphylococcus aureus*. *Journal of Antimicrobial and Chemotherapy* 48(4), 487–491.

Akinyemi, K.O., Bayagbon, C., Oyefolu, A.O.B., Akinside, K.A., Omonigbeyin, E.A. and Coker, A.O.(2000).Antibacterial screening of five indigenous Nigerian medicinal plants against *S. typhi* and *S. paratyphi*. *Journal of Nigerian infection control association*, 3: 30–33.

Allen, G.M., Bond, M.D. and Main, M.B. (2009). '50 Common Native Plants Important in Florida's Ethnobotanical

History'. University of Florida IFAS Extension, Wildlife Ecology Conservation Department, Circular 1439.

Arawande J. O and Komolafe, E. A. (2010).Antioxidative Potentials of Banana and Plantain Peel Extracts on Crude Palm Oil. *Ethnobotanical Leaflets* 14: 559-569.

Cushnie, T.P.T. and Lamb, A.J. (2005).Antimicrobial, activity of flavonoids. *International Journal of Antimicrobial Agents,* 26(5), 343–356.

Egbuna, A.C., Obasi, N.L., Ukoha, P.O. and Ejikeme, P.M. (2015). Comparative phytochemical and antimicrobial screening of some solvent extracts of *Samanea saman* pods. *African Journal of Pure and Applied chemistry* 4(9): 206-212.

Gbile, Z.O. (2002). *Vernacular names of Nigerian Plants in Yoruba.* Forestry Research Institute of Nigeria, Ibadan.101 pp.

González, M.E., Martínez-Abarca, L. and Carrasco, F. (1990). Flavonoids: Potent inhibitors of poliovirus RNA synthesis. *Antivirus Chemistry and Chemotherapy* 1(3), 203-209.

Harborne, J.B. (1998). Phytochemical Methods - A Guide to Modern Techniques of Plant Analysis. Chapman and Hall, London. pp. 182-190.

Haslem, E.(1989). Plant Polyphenol: Vegetal tannin relisted-Chemistry and Pharmacology of Natural Products, Cambridge University Press.

Idowu, O.A., Soniran, O.T., Ajana, O. and Aworinde, D.O. (2009). Ethnobotanical survey of antimalarial plants used in Ogun State, South West Nigeria

Igoli, J.O., Ogaji, O. G., Tor-Anyiin, T. A. and Igoli, N. P. (2005). "Traditional medicine practice amongst the Igede people of Nigeria. Part II". *African Journal of Traditional, Complementary and Alternative Medicines*. 2: 134-152.

Islam, A. K., Ali, M. A., Sayeed, A., Salam, S. M., Islam, A., Rahman, M., Khan, G, R. and Khatun, S. (2003). An antimircrobial terpenoid from Caesalpinia pulcherrima Swartz.: Its characterization, antimicrobial and cytotoxic activities. *Asian Journal of Plant Science* 2: 17-24

Kadiri, M. Ojewumi, A.W., Agboola, D.A., Adekunle, M.F., Yahaya, M., Bala, S.A. and Hussain,A.M. (2014a). Ethnobotanical survey of plants used in the management of Diabetes mellitus in Abeokuta, *Nigeria. Nigerian Journal of Botany*, Volume 27(1), 83-100.

Kadiri, M., Ojewumi, A.W., Kehinde, I.A., Salma, M.G., Yahaya, M., Bala, S.A and Hussain, A.M. (2014b). A survey and identification of plants used for management of high blood pressure in Rimim Local Government Area of Kano State, Nigeria. *Nigeria Nigerian Journal of Botany*, Volume 27(1), 17-28.

Kao, T.H., Huang, S.C., Inbaraj,B.S. and Chen, B.H. (2008).Determination of flavonoids and saponinsin Gynostemma pentaphyllum (Thunb) Makino by liquid chromatography – mass spectrophotometry. Analytical Chimica Acta, 626, 200 – 211.

Mann,A.,Yahaya,Y., Banso,A. and John, F. (2008).Phytochemical and antimicrobial activity of *Terminaliaavicennioides* extracts against some bacteria pathogens associated with patients suffering from complicated respiratory tract diseases. *Journal of Medicinal Plants Research* Vol. 2(5), pp. 094-097.

Mustapha, A.A., Fawibe,O.O., Ajiboye, A.A. and Agboola, D.A.(2014). Ethnobotanical Survey of medicinal plants used in the treatment of Diabetes in Irepodun Local Government Area of Osun State, Nigeria. *Greener Journal of Biological Sciences*Vol.4(2) pp 059 – 068.

Muthu, C., Ayyanar, M., Raja, N., and Ignacimuthu, S. (2006). Medicinal plants used by traditional healers in Kancheepuram District of Tamil Nadu. *India Journal of Ethnobiology and Ethnomedicine* 2:43.

Nitta, T.,Arai,T.,Takamatsu,H.,Inatomi,Y.,Murata, H., Iinuma, M., Tanaka, T., Ito, T., Asai, F., Ibrahim, I., Nakanishi, T. and Watabe, K. (2002).Antibacterial activity of extracts prepared from tropical and sub-tropical plant sonmethicillin-resistant *Staphylococcus aureus*. *JournalofHealthScience*48,273–276.

Odebiyi, A.and Sofowora (1990). Phytochemical Screening of Nigerian Medicinal Plants. Part III, Lioyeria, 41:234 – 246.

Ody, P.(1993). The Complex Medicinal Herbal. Dorling Kindersley Limited, New York, pp. 132–171.

Ojewumi, A. W and Kadiri, M. (2014). "Physiological Evaluation of the Anti-Diabetic Properties of *Morinda lucida* on

Rats".*Australian Journal of Basic and Applied Sciences*. 7 (14): 359- 360.

Okwu, D. E. (2006).The Potential of *Ocimum gratissium, Pengluria extensa* and *Tetrapleura tetraptera* as spice and flavouring agents. *Journal of Chemical Society of Nigeria*, 31(1&2): 38-42.

Okwu, P. E. (2003). Investigation into the medical and Nutritional potential of *Garcinia kola* (bitter kola). Heckle and Dennettia Tripetala Garcinia baker, PH.D. Dissertation of Michael Opara University of Agriculture Umudike, Nigeria; 5 – 10.

Okwu, D. E. (2001). "Evaluation of chemical composition of medicinal plants belonging to Euphorbiaceae". *Pakistan Veterinary Journal.*, 14: 160-162.

Oksman-Caldentey,K.-M. and Inze´, D. (2004).Plantcellfactoriesinthe post-genomic era:newwaystoproducedesignersecondarymetabolites. *Tren ds in Plant Science* 9,433–440.

Raquel, F. E. (2007). Bacterial lipid composition and antimicrobial efficacy of cationicsteroid compounds. *Biochemica et Biophysica Acta*. 2500-2509.

Schuier, M., Sies, H., Illek, B. and Fischer, H. (2005). Cocoa-related flavonoids inhibit CFTR-mediated chloride transport across T84 human colon epithelia. *Journal of Nutrition*, 135(10), 2320–2325.

Strick, R. P.L. Strissel, S. Borgers, S.L. Smith, J.D. Rowley (2000). Dietary bioflavonoidsinduce cleavage in the MLL

gene and may contribute to infant leukemia. *Proc. National Academic Science* U.S.A., 9(9), 4790–4795.

Timo, D.S., Dorah, J.M. and Onesmo, B.B. (2013). Ethnopharmacological Survey of Plants Used in the Traditional Treatment of Gastrointestinal Pain, Inflammation and Diarrhoea in Africa: Future Perspectives for Integration into Modern Medicine. *Animals* 3: 158-227.

Tony, F. (2005). Nutritional and Diet Resource for Cancer prevention and Survival3rdEdition, Replika press ltd. Washington DC. Pp 51-60.

Usher, G. (1984). A Dictionary of Plants Used by Man. C.B.S Publishers and Distributors, Delhi-110032, India publication. 220.

Yahaya, O., Tijjani, M.B., Abraham, O.J.,Umar, I.O., Miachi, O.E. and Usman, B. (2011). Anti- microbial activity of crude extracts of *Daniellia oliveri* against some bacterial associated with enteric infections.

Table1: Socio-economic characteristics of Respondents

Socio-economic Variables	Frequency	Percentage (%)	Mode
Sex			
Male	45	22.5	
Female	155	77.5	Female
Age			
Below 20	18	9.0	
20 - 29 Yrs	46	23.0	
30 - 39 Yrs	47	23.5	40 – 49 Yrs
40 – 49 Yrs	49	24.5	
50 – 59 Yrs	31	15.5	
60 – 69 Yrs	5	2.5	
Above 69	4	2.0	
Marital status			
Single	51	9.0	
Married	127	63.5	Married
Divorced	18	25.5	
Widowed	4	2.0	
Religion			
Christianity	83	41.0	Christianity
Islam	100	50.0	
Traditional	17	8.5	
Level of Education			
No Formal Education	38	19.0	
Primary Education	82	41.0	Primary
Secondary Education	50	25.0	Education
Tertiary Education	30	15.0	
Year of Experience			
1-10 Yrs	69	34.5	
11 – 20 Yrs	91	45.5	11 – 20 Yrs
21 – 30 Yrs	28	14.0	
31 – 40 Yrs	12	6.0	
Sources of Knowledge of sale of Herbal materials	79	39.5	Inheritance
Inheritance	56	32.0	
Apprenticeship	56	28.0	
Interest	01	0.5	
None			
Household Size			
1-3			
4-6	69	34.5	
7-9	99	49.5	4-6

Above 10	26		13.0	
	6		3.0	
Annual Income				
< 50,000	10		5.0	
50,001 – 100,000	67	33.5		100,001-
100,001 – 150,000	116		58.0	150,000
150,001- 200,000	5		2.5	
> 200,000	2	1.0		

Field Survey, 2015

Table 2a: Summary of plant species exploited and used in the treatment of bacterial and fungal diseases in the study area

S/no	Common name/ Local name	Scientific name/Plant form	Family	WT	FR	TB	DR	RW	TYF	BL	Frequency
1.	Bhabram/Ewe-owo	*Aerva lanata* (Linn.) Juss.(H,C)	Amaranthaceae	✓	-	-	✓	-	-	-	3
2	Goatweed/Imi-esu	*Ageratum conyzoides* Linn.(H,U)	Asteraceae	✓	-	-	✓	-	-	-	3
3	Aloe vera/Ahon-erin	*Aloe vera*(S,C)	Liliaceae	✓	-	-	-	-	-	-	5
4	Joyweed/Dagunro	*Alternanthera pungens* H. B.& K. (H,C)	Amaranthaceae	✓	✓	✓	✓	✓	✓	-	2
5	Camphos/Aruntaba	*Blumea perrottetiana*DC.(T,U/C)	Compositae	✓	-	✓	-	-	-	-	2
6	Hogweed/Eti-ponnla	*Boerhavia diffusa*Linn.(H,U)	Nyctaginaceae	✓	-	-	-	-	-	-	4
7	Button grass/Irawo-ile	*Borreria ocymoides*(Burm.f.) DC. (S,U)	Rubiaceae	✓	-	-	-	-	-	-	1
8	Christ plant/Lefunlosun	*Caladium bicolor*(H,U)	Araceae	✓	-	-	-	-	-	✓	10
9	Sodom apple /Bomubomu	*Calotropis procera*(Ait).f. (S,U)	Asclepidiaceae	✓	✓	-	-	✓	-	✓	10
10	Crabwood/ Abo-oganwo	*Carapa procera*DC. (T,U)	Meliaceae	✓	-	-	-	✓	-	-	3
11	Pawpaw/Sigun	*Carica papaya*Linn.(T,U/C)	Caricaceae	✓	-	-	-	-	-	-	6
12	Goldenflower/Aidantoro	*Cassia fistulosa*(T,C)	Leguminosae:	✓	-	-	-	-	-	-	6

13	Fodder pea/Ewa-ahun	*Centrosema pubescens* Benth. (H,U)	Sub family: Papilioniaceae Leguminosae: Sub family: Papilioniaceae	✓	✓	✓	-	✓	-	-	14
14	Wormwood/ Arunpale	*Chenopodium ambrosoides (H,U/C)*	Chenopodiaceae	✓	✓	-	-	✓	✓	-	17
15	Lime/Osan-wewe	*Citrus aurantifolia* (Christon) Swingle (T,C)	Rutaceae	✓	✓	✓	-	✓	✓	-	10
16	Coconut/ Agbon	*Cocos nucifera* Linn.(T,C)	Chenopodiacae	✓	-	-	-	✓	✓	-	7
17	Balsam/ Iya	*Daniellia oliveri* (Rolfe) Hutch.& Dalziel (T,C)	Leguminosae	✓	✓	✓	✓	✓	✓	✓	77
18	Hennaplant/ Laali	*Lawsonia inermis*Linn. (S,C)	Lythraceae	✓	✓	✓	✓	✓	✓	✓	53
19	Tobacco/Ewe-taba	*Nicotiana tabacum*Linn. (H,C)	Solanaceae	✓	-	✓	-	✓	-	-	1
20	Basil/ Efinrin	*Ocimum gratissimum*Linn. (S,C/U)	Labiaceae	✓	✓	✓	✓	✓	✓	✓	80
21	Waterleaf/ Gbure	*Talinum triangulare*(Jacq.) (H,U)	Portulacaceae	✓	-	-	-	-	-	✓	5
22	Idin	*Terminalia avicennoides*Guill.& Perr.(T,C)	Combretaceae	✓	✓	✓	✓	✓	✓	✓	69
23	Crab's eye/ Omisinmisin	*Abrus precatorious* Linn.(S,C)	Leguminosae: Sub family:	-	✓	-	-	-	-	-	5

			Papilionaceae									
24	Acalypha/Jinwinini	*Acalypha fimbriata*(S,C)	Euphorbiaceae	-	✓	-	-	-	-	-		7
25	Baobab/Ose	*Adansonia digitata*Linn.(T,C)	Bombacaceae	-	✓	-	-	-	-	-	1	
26	spring onion/ Alubosa – elewe-	*Allium cepa*L.var.n *aggregatum* G.Don. (Bulbous plant,C)	Alliaceae	-	✓	✓	-	-	-	-	7	
27	Aloe/Eti-erin	*Aloe barteri*	Liliaceae	-	✓	-	-	-	-	-	3	
28	Cocoyam/ koko	*Colocasia esculenta* (Linn.) Schott.(H,C)	Araceae	-	✓	-	-	-	-	-	2	
29	Turmeric/Atale-pupa	*Curcuma longa*(T,C/U)	Zingiberaceae	-	✓	-	-	-	-	-	4	
30	Pasture weed/Saweere	*Alternanthera sessilis*(Linn.) DC.(H,U)	Amaranthaceae	-	✓	-	-	-	-	-	4	
31	Cotton/Owu	*Gossypium barbadense*Linn. (T,C)	Malvaceae	-	✓	✓	✓	-	✓	-	2	
32	Harrisonia/ Arunjeran	*Harrisonia abyssinica* Oliv.(S,C)	Simaroubaceae	-	✓	-	-	✓	-	-	3	
33	Physic nut/ Botunje funfun	*Jatropha curcas*Linn.(S,C/U)	Euphorbiaceae	-	✓	-	✓	✓	-	✓	5	
34	Wild cassava/ Botunje pupa	*Jatropha gossypifolia*Linn. (S,C/U)	Euphorbiaceae	-	✓		-	✓	-	-	4	
35	Mango/ Mangoro	*Mangifera indica* Linn.(T,C)	Anacardaceae	-	✓	✓	-	✓	✓	✓	7	
36	Button grass/ Mitracarpus/Irawo-ile	*Mitracarpus scaber*Zucc. (H,U)	Rubiaceae	-	✓	-	-	✓	-	-	2	
37	Silver bush/Rinrin	*Peperomia pellucid*(Linn.)	Piperaceae	-	✓	-	-	-	-	✓	7	

		H.B.& K.(H,U)										
38	Amarus plant/ Eyin-olobe	*Phyllanthus amarus*Schum.& Thonn.(H,C)	Euphorbiaceae	-	✓	-	-	-	-	-	5	
39	African breadfruit/ Ifon	*Treculia africana*Decne (T,C)	Moracae	-	✓	-	-	-	-	✓	2	
40	Black plum/ Oori	*Vitex doniana*Sweet (T,C)	Verbenaceae	-	✓	✓	✓	✓	-	-	4	
41	Monkey kola/ Obi-edun	*Cola millenii* K. Schum. (T,C)	Sterculiaceae	-	-	-	✓	-	-	-	4	
42	Red Oilpalm/ Ope	*Elaeis guineensis* Jacq. (The African oil palm,C)	Palmae	-	-	✓	-	✓	-	-	3	
43	Sandpaper plant/Eepin	*Ficus exasperata* Vahl (T,U)	Moraceae	-	-	-	-	✓	-	-		5
44	Hygrophilia/ Mafowokanmi	*Hygrophilia auriculata* (H,U)	Acanthaceae	-	-	-	-	✓	-	-	2	
45	Bankas/ Oridun	*Justicia flava* (Forssk.) Vahl(H,C)	Acanthaceae	-	-	-	-	✓	-	-	3	
46	Bitter gourd/ Ejirin-wewe	*Momordica charantia* Linn. (Annual climber,C)	Cucurbitaceae	-	-	-	-	✓	✓	-	3	
47	Bloodwood, Camwood/Iyeri-osun	*Pterocarpus osun*Craib (T,C)	Leguminosae: Sub family: Papilionaceae	-	-	-	-	✓	-	-	2	
48	Rangoon creeper/ Ogan-igbo	*Quisqualis indica* Linn. (S,U)	Combretaceae	-	-	-	-	✓	-	-	3	
49	Serpent wood/ Asofeyeje	*Rauvolfia vomitoria* Afzel.(T,C)	Apocynaceae	-	-	-	-	✓	✓	-	5	

50	Alligator pepper/ Ataare	*Aframomum melegueta* K.Schum. (H,C)	Zingiberaceae	-	-	✓	-	-	-	-	7	
51	Stoolwood/ Ahun	*Alstonia boonei*De Wild. (T,U)	Apocynaceae	-	-	✓	-	-	✓	-	2	
52	Euadenia/ Logbokiyan	*Euadenia trifoliolata* (Schum. & Thonn.) Oliv.(S,C)	Capparaceae	-	-	✓	-	-	-	-	3	
53	Bitter kola/ Orogbo	*Garcinia kola*Heckel (T,C)	Guttiferae	✓	✓	✓	✓	✓	✓	✓		57
54	Cassava/ Gbaguda	*Manihot esculenta* Crantz. (S,C)	Euphorbiaceae	-	-	✓	-	-	-	-		6
55	Brimstone/ Oruwo	*Morinda lucida*Benth. (T,C)	Rubiaceae	-	-	✓	-	-	✓	-	12	
56	Moringa,Horse radish/ Ewe-igbale	*Moringa oleifera*Lam.(T,C)	Moringaceae	-	-	✓	-	-	✓	-	8	
57	Dwarf banana/ Ogede omini	*Musa nana* (T,C)	Musaceae	-	-	✓	-	-	-	-	6	
58	Palisota/ Rogbo-agutan	*Palisota hirsuta*(Thunb.)K. Schum. (H,C)	Commelinaceae	-	-	✓	-	-	-	-	5	
59	Aridan plant/ Aidan	*Tetrapleura tetraptera* (Schum. & Thonn.) Taubert (T,C)	Leguminosae : Sub family: Papilioniaceae	-	-	✓	-	-	-	✓	10	
60	False thorn albizia/ Ayinre-ogo	*Albizia ferruginea* Guillemin & Perrottet (T,C)	Leguminosae : Sub family: Papilioniaceae	-	-	-	✓	-	-	-	5	
61	African false currant/ Eekan-ehoro	*Allophylus africanus* P.Beauv. (S,C)	Sapindaceae	-	-	-	✓	-	-	-	4	
62	Thorny green amaranth/ Tete-elegun	*Amaranthus spinosus*Linn. (H,U)	Amaranthaceae	-	-	-	✓	-	-	-	3	

63	Siam weed/ Akintola	*Chromolaena odorata*(Linn.) King & Robinson (S,U)	Asteraceae	-	-	-	✓	-	✓	-	6
64	African cordial/ Omo	*Cordia millenii* Baker (T,C)	Boraginaceae	-	-	-	✓	-	-	-	20
65	Cedar mahogany/ Jebo	*Entandrophragma utile*(Dawe & Sprague) Sprague (T,C)	Meliaceae	-	-	-	✓	-	-	-	12
66	Sasswood, Ordeal/ Obo	*Erythrophleum suaveolens* (Guillemin & Perrottet)Brenan (T,C)	Leguminosae : Sub family: Papilioniaceae	-	-	-	✓	-	-	✓	11
67	Porcelain vine/ Asoro	*Ficus elegans*(T,C)	Moraceae	-	-	-	✓	-	-	-	10
68	Sword lily, corn flag/ Baaka	*Gladiolus psittacinus* Hook (H,C/U)	Iridaceae	-	-	-	✓	-	-	-	6
69	Masquerade stick/ Atori	*Glyphea brevis*(Spreng.) Monachino (S,U)	Tiliaceae	-	-	-	✓	-	-	-	5
70	African peach/ Egbesi	*Nauclea latifolia*Sm.(S,T,C)	Rubiaceae	-	-	-	✓	-	✓	-	2
71	African parquetina/ Ewe-ogbo	*Parquetina nigrescens* (Afzei.) Bullock (S,C/U)	Periplocaceae	-	-	-	✓	-	-	✓	19
72	Anamu/ Awogba	*Petiveria alliaceae* Linn.(H,C)	Phytolaccaceae	-	-	-	✓	-	-	-	12
73	Pseudocedrela/ Emigbegi	*Pseudocedrela kotschyi* (Schweinf.) Harms (T,C)	Meliaceae	-	-	-	✓	-	-	-	3
74	Guava/ Goba	*Psidium guajava*Linn. (S/T,C)	Myrtaceae	-	-	-	✓	-	-	-	5

75	Bitter leaf/ Ewuro	*Vernonia amygdalina* Del.(S,U/C)	Asteraceae	-	-	-	✓	-	✓	✓	3
76	Cashewnut tree/ Kaju	*Anacardium occidentale* Linn. (T,C)	Anacardaceae	-	-	-	-	-	✓	-	5
77	Pineapple/ Ope-oyinbo	*Ananas comosus*(Linn.) Merrill (Semi-woody perennial H,C)	Araceae	-	-	-	-	-	✓	-	6
78	Neem /Dongoyaro	*Azadirachta indica*A.Juss. (T,U/C)	Meliaceae	-	-	-	-	-	✓	-	2
79	Bamboo/ Oparun	*Bambusa vulgaris* Schrad. (T,C/U)	Bombacaceae	-	-	-	-	-	✓	-	1
80	Pigeon pea/ Otili	*Cajanus cajan*(Linn.) Millsp.(woody shrub,C)	Leguminosae: Sub family : Papilioniaceae	-	-	-	-	-	✓	-	2
81	Bitter sweet/ Ponju-owiwi	*Reissantia indica*(Willd.) Halle (S,C)	Celastraceae	-	-	-	-	-	✓	-	5
82	Citron/ Osan ijaganyin	*Citrus aurantifolia* (Christon.)Swingle (T,C)	Rutaceae	-	-	-	-	-	✓		2
83	Sweet orange/ Osan mimu	*Citrus sinensis* Osbeck (T,C)	Rutaceae	-	-	-	-	-	✓		2
84	Lemon grass/ Ewe-tii	*Cymbopogon citrates* (DC.) Stapf(G,U/C)	Poaceae	-	-	-	-	-	✓	-	10
85	African yellow wood/ Awopa	*Enantia chlorantha* Oliv. (T,C)	Annonaceae	-	-	-	-	-	✓	-	7
86	Sausage tree/Pandoro	*Kigelia africana* (Lam.) Benth. (T,C/U)	Bignoniaceae	-	-	-	-	-	✓	-	3
87	Prickly amaranthus/	*Alternanthera*	Amaranthaceae	-	-	-	-	-	-	✓	3

	Reku-reku	*sessilis*(Linn.) DC (T,C)								
88	Sandpaper raisin/ Okere	*Grewia flavescens* Juss.(S,C)	Tiliaceae	-	-	-	-	-	-	✓ 5
89	Sweet potato/ Odunkun	*Ipomea batatas* (Linn.) Lam.(P,C)	Convolvulaceae	-	-	-	-	-	-	✓ 3
90	Wild mango/ Orombeje	*Irvingia gabonensis* (O'Rorke) Baill.(T,C)	Irvingiaceae	-	-	-	-	-	-	✓ 2
91	False marula/ Ekudan	*Lannea egregia* Engl.& K.Krause (T,C)	Anacardiaceae	-	-	-	-	-	-	✓ 10
92	Locust bean tree/ Irugba	*Parkia biglobosa* (Jacq.)R.Br.ex.G.Don (T,C/U)	Leguminosae: Sub family: Papilioniaceae	-	-	-	-	-	-	✓ 3

Field Survey, 2015

Legend:

No of plant species = 92, No of families = 50, T- Tree-60 (65.2%); S-Shrub- 15 (16.3%); H-Herbs-17 (18.5%); C-Cultivated-80 Species; U- Uncultivated-20-Species; DR:Diarrhoea; RW: Ringworm; WT: Whitlow; TYF: Typhoid Fever, FR: Footrot , BL: Boil, TB: Tuberculosis, (✓) : useful (-): not-useful.

Table 2b: Mode of preparation and administration of some plant species used in the treatment of diseases in the study area.

S/no	Plant species singly or combination	Parts used	Infection/Disease	Preparation type	Mode of Use
1	*Aerva lanata, Lawsonia inermis*, *Celastrus indica Cymbopogon citratus, Nauclea latifolia, Alstonia boonei*	Leaves, Stem bark, Root bark	Typhoid fever	Decoction Boil *A.lanata, L. inermis, C.citratus* leaves; stem bark of *Alstonia boonei* and *Nauclea latifolia* root bark in water	About 250 ml of the preparation is taken twice daily.
2	*Nauclea latifolia, Celastrus indica, Garcinia kola Mangifera indica*	Leaves	Typhoid fever	Decoction Boil *Celastrus indica*and *N.latifolia* root barks*; M.indica* and *G.kola* stem barks in water.	About 250 ml of the preparation is taken three times daily.
3	*Morinda lucida*;	Leaves	Typhoid fever	Macerated juice is mixed with salt or boil leaves with corn steep liquor.	5-10 tablespoonfuls of the preparation is taken every morning.
4	*Momordica charantia*, *Rauwolfia vomitoria*	Leaves	Typhoid fever	Decoction Boil leaves in water	A cup-full of the preparation is taken daily.
5	*Cajanus cajan; Cymbopogon citrates; Lawsonia inermis, Citrus aurantium*	Leaves, fruit	Typhoid fever	Decoction Boil leaves and unripe fruits of *C. aurantium*in water for 10 minutes	About 250 ml of the preparation is taken twice daily.

6	*Enantia chlorantha*	Stem bark	Typhoid fever	Maceration Soak stem bark in Seven-up for 24 hours	A cup-full (250 ml) of the preparation is taken daily before breakfast.
7	*Daniellia oliveri*	Stem bark	Typhoid fever	Decoction Boil stem barks in water	A cup-full of the preparation is taken three times daily
8	*Gossypium sp.;*	Leaves	Typhoid fever	Decoction Boil leaves of *Gossypium spp*.in water for 1 hour	The preparation is taken twice daily
9	*Kigelia Africana*	Fruit	Typhoid fever	Burn the fruits into ashes.	A table spoonful of the powder is taken with pap every morning
10	*Cocos nucifera, Citrus aurantifolia, Gossypium spp*	Leaves, fruit	Typhoid fever	Decoction Boil leaves of *Gossypium spp* , stem bark of *Cocos nucifera* and unripe fruits of *C. aurantifolia* in water	The decoction is taken twice daily
11	*Dysphania ambrosioides*	Leaves	Typhoid fever	Decoction	About 250 ml of the preparation is taken every day.
12	*Calotropis procera*	Leaves	Whitlow	Maceration Macerated leaves juice	Apply juice topically on the affected part every day.
13	*Centrosema pubescens*	Seed	Boil / Ringworm	Powder Burn the seed into ashes and mix with palmoil.	Apply topically on the affected part twice daily.

14	*Calotropis procera*	Leaves	Boil, ringworm, Footrot	Macerate Macerated fresh leaves mixed grinded with local black soap.	Bath with the preparation or apply topically on the affected part once or twice daily.
15	*Garcinia kola, Terminalia avicennoides, Daniellia oliveri*	Stem bark	Ringworm, Footrot, Whitlow, Boil	Decoction Stem barks boil in water	The decoction is used for bathing once or twice daily.
16	*Parquetina nigrescens*	Leaves	Diarrhoea/ Dysentry	Maceration Macerated leaves juice added with a tablespoonful of salt	The preparation is taken twice daily.
17	*Petivera alliaceae, Jatropha curcas, Gossypium spp.*	Leaves	Diarrhoea/ Dysentry	Decoction Stem barks boil in water	The decoction is used for bathing once or twice daily.
18	*Vitex doniana*	Stem bark	Diarrhoea/ Dysentry	Maceration Soaked in water for 2 or 3 days	A glass cup full of preparation is taken for 2 days.
19	*Mangifera indica, Dannielia oliveri*	Stem bark	Boil , ringworm	Decoction Boil the plant species in water.	The decoction can be taken 2 or 3 times daily or used for bathing.

20	*Jatropha curcas*	Fruit	Boil ,Ringworm	Burn into ashes and mix with local black soap	Bath with the soap on daily basis.
21	*Cassia fistulosa, Erythrophleum suaveolens*	Stem bark	Ringworm, boil, whitlow	Topical Grind the stem barks with sulphur and mix with local black soap	Apply the soap topically on the affected part or used the soap for bathing.
22	*Terminalia avicennoides*	Stem bark	Ringworm	Decoction Boil the stem bark in water	Bath with the preparation twice daily.
23	*Aerva lanata,* *Cordia milleni,* *Vitex doniana*	Seed Stem bark Stem bark	Diarrhoea/ dysentery	Maceration Soak in water for 2 days	A cup full of the preparation is taken 2 or 3 times daily.
24	*Carica papaya* *Cajanus cajan* *Azadirachta indica* *Citrus aurantifolia* *Chromolaena odorata*	Leaves Leaves Leaves Leaves ,fruit Leaves	Typhoid fever	Decoction Boil in water or corn steep liquor	A cup full of the preparation is taken 2 or 3 times daily.
25	*Glyphaea brevis*	Root	Boil	Decoction Boil in water	About 350 ml is taken 2 or 3 times daily.
26	*Moringa oleifera*	Leaves	Dysentery	Powder Air-dry the leaves and grind into powder	A tablespoonful of the powder is taken with pap or water daily.
27	*Euadenia trifololiata* *Allium ascalonicum* *Blumea perrottetiana*	Root bark Leaves Stem bark	Tuberculosis	Maceration Cut the root and stem barks into pieces and soak in water	A tablespoonful of the preparation is taken 3 times daily.

				for 24 hours to remove the bark, then add *A. ascalonicum* leaves and grind to make paste. Put the paste in local pot, add shea butter, a bottle of palm oil and mix together.	
28	*Garcinia kola*	Seed	Tuberculosis	Powder Grind with mortal and pestle	A tablespoonful of the powder is taken with pap or water daily, preferably before breakfast.
29	*Treculia Africana*	Root bark	Tuberculosis	Maceration Soak in water for 2 days	About 250 ml of the preparation is taken twice every day.
30	*Gossypium spp;* *Vitex doniana;* *Mangifera indica* *Morinda lucida*	Leaves Leaves Stem bark Leaves	Tuberculosis	Decoction Boil in water	About 350 ml is taken twice daily.
31	*Musa nana*	Fruit	Tuberculosis	Blend to make paste ,mix with honey	To be taken 2 or 3 times daily.
32	*Jatropha curcas*	Leaves/stem	Ringworm	Decoction Boil in water	About 250 ml of the preparation is taken every day
33	Wild cassava/ Botunje pupa	Leaves	Ringworm , footrot	Maceration	Macerated juice is applied topically on the affected part.

34	*Daniellia oliveri* *Terminalia avicennoides* *Parkia biglobosa*	Stem bark	Tuberculosis	Decoction Boil in water or corn steep liquor	A glass cup full is taken twice daily.
35	*Mitracarpus scaber*	Whole plant	Ringworm /whitlow	Topical Burn into ashes and mix with sulphur	Apply topically to the affected part.
36	*Peperomia pellucid*	Leaves	Foot rot	Maceration	Macerated juice applied topically on the affected part.
37	*Phyllanthus amarus*	Leaves	Foot rot	Maceration	Macerated juice applied topically on the affected part twice daily.
38	*Treculia Africana*	Root	Foot rot, Tuberculosis, Typhoid fever	Maceration Decoction Decoction	Macerated juice applied topically on the affected part. Decoction is taking twice daily.
39	*Ocimum gratissimum*	Leaves	Dysentery , Diarrhoea	Maceration Macerated juice mixed with salt	The preparation is taken before breakfast for 2 or 3 days
40	*Ocimum gratissimum, Vernonia amygdalina*	Leaves	Typhoid fever	Maceration Macerated juice mixed with salt	The preparation is taken twice daily for 5 to 7 days.
41	*Ficus exasperate*	Leaves	Ringworm	Maceration	Macerated juice applied topically on the infection site.

42	*Lawsonia inermis*	Leaves	Ringworm /foot rot , boil, whitlow	Decoction Boil fresh leaves in water	The decoction is taken three times daily.
43	*Ananas comosus,* *Bambusa vulgaris* *Carica papaya* *Azadirachta indica*	Fruit Leaves Leaves Leaves	Typhoid fever	Decoction Boil unripe fruits of *A. comosus* and fresh leaves of *C. papaya, A. indica* and *B. vulgaris* in water	About 350 ml is taken twice daily.

Table 2c: List of top five priority plants in the two Local Government Areas studied

S/no	Family	Scientific name/Plant form {Tree,T Shrub(S), Herb(H)}	Common / Local name	WT	FR	TB	DR	RW	TPD	BL	Frequency		Parts used	Mode of use
1	Leguminosae	*Daniellia oliveri(T)*	Balsam/ Iya	✓	✓	✓	✓	✓	✓		✓	77	Stem bark	Decoction
2	Lythraceae	*Lawsonia inermis(S)*	Hennaplant / Laali	✓	✓	✓	✓	✓	✓		✓	53	Leaves	Topical
3	Guttiferae	*Garcinia kola (T)*	Bitter kola/ Orogbo	✓	✓	✓	✓	✓	✓		✓	57	Stem bark	Decoction

4	Labiatae	*Ocimum gratissimum (H)*	Basil/ Efinrin	✓	✓	✓	✓	✓	✓	✓	✓	80	Leaves	Decoction
5	Combretaceae	*Terminalia avicennoides (T)*	Idin	✓	✓	✓	✓	✓	✓	✓	✓	69	Stem bark	Decoction

Key :

Tree :T
Shrub:S
Herb:H
✓: useful
-: not-useful

WT:Whitlow
FR: Footrot
TB:Tuberculosis
DR:Diarrhoea
RW: Ringworm

TPD: Typhoid
BL: Boil

Table 3: Quantitative phytochemical screening of *Ocimum gratissimum* leaves and *Daniellia oliveri* stem bark

Plant Extracts	Steroid	Alkaloids	Phenols	Tannins	Flavonoid	Saponin	Terponoid	Anthocyanin	Anthraquinone
*Ocimum gratissimum*CSL	0.200 ±0.010^{cd}	0.845 ±0.005^{b}	0.210 ±0.010^{b}	11.705 ±0.145^{c}	0.450 ±0.010^{c}	1.220 ±0.020^{e}	0.140 ±0.010^{c}	0.025 ±0.005^{b}	0.300 ±0.010^{ab}
Ocimum gratissimum Aqeous	0.155 ±0.005^{d}	0.225 ±0.005^{e}	0.145 ±0.005^{c}	10.295 ±0.045^{d}	0.330 ±0.010^{d}	1.070 ±0.010^{f}	0.125 ±0.005^{c}	0.015 ±0.005^{b}	0.270 ±0.010^{b}
Ocimum gratissimum Ethanol	0.325 ±0.015^{b}	0.910 ±0.010^{a}	0.805 ±0.005^{a}	12.525 ±0.075^{b}	0.765 ±0.015^{b}	2.325 ±0.025^{b}	0.200 ±0.010^{b}	0.050 ±0.010^{b}	0.315 ±0.005^{a}
Daniellia oliveri CSL	0.195 ±0.005^{cd}	0.685 ±0.005^{c}	0.135 ±0.005^{cd}	7.580 ±0.030^{f}	0.265 ±0.005^{ef}	1.705 ±0.005^{d}	0.120 ±0.010^{c}	0.030 ±0.010^{b}	0.165 ±0.005^{d}
Daniellia oliveri Aqueous	0.160 ±0.010^{d}	0.510 ±0.010^{d}	0.105 ±0.005^{d}	6.240 ±0.010^{g}	0.220 ±0.010^{f}	1.110 ±0.010^{f}	0.100 ±0.010^{c}	0.015 ±0.005^{b}	0.145 ±0.005^{d}
Daniellia oliveri Ethanol	0.225 ±0.005^{c}	0.865 ±0.015^{b}	0.165 ±0.005^{c}	9.590 ±0.010^{e}	0.310 ±0.010^{de}	1.925 ±0.005^{c}	0.145 ±0.005^{c}	0.035 ±0.005^{b}	0.185 ±0.005^{cd}

^{abc}Mean values (±Standard error) of each of the phytochemicals in the same column having the same superscript are not significantly different at $p < 0.05$. CSL = Corn Steep Liquor.

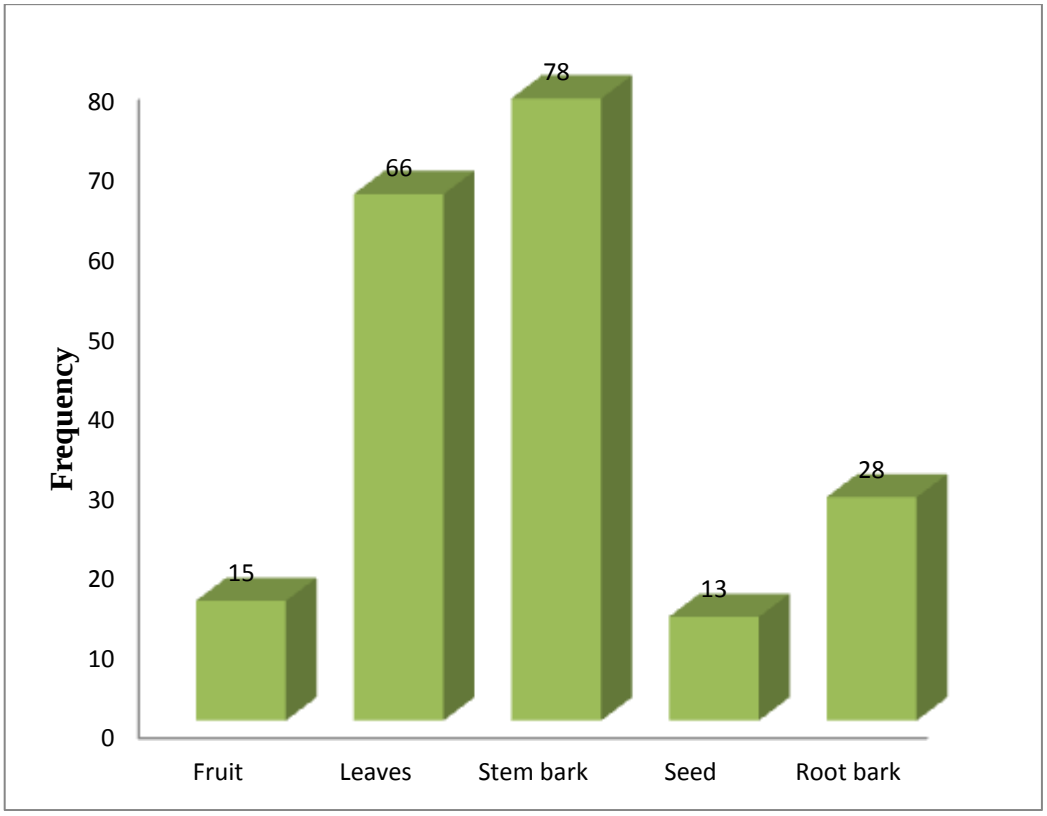

Figure 1: Frequency distribution of plant parts commonly used as medicine in Abeokuta, Ogun State.

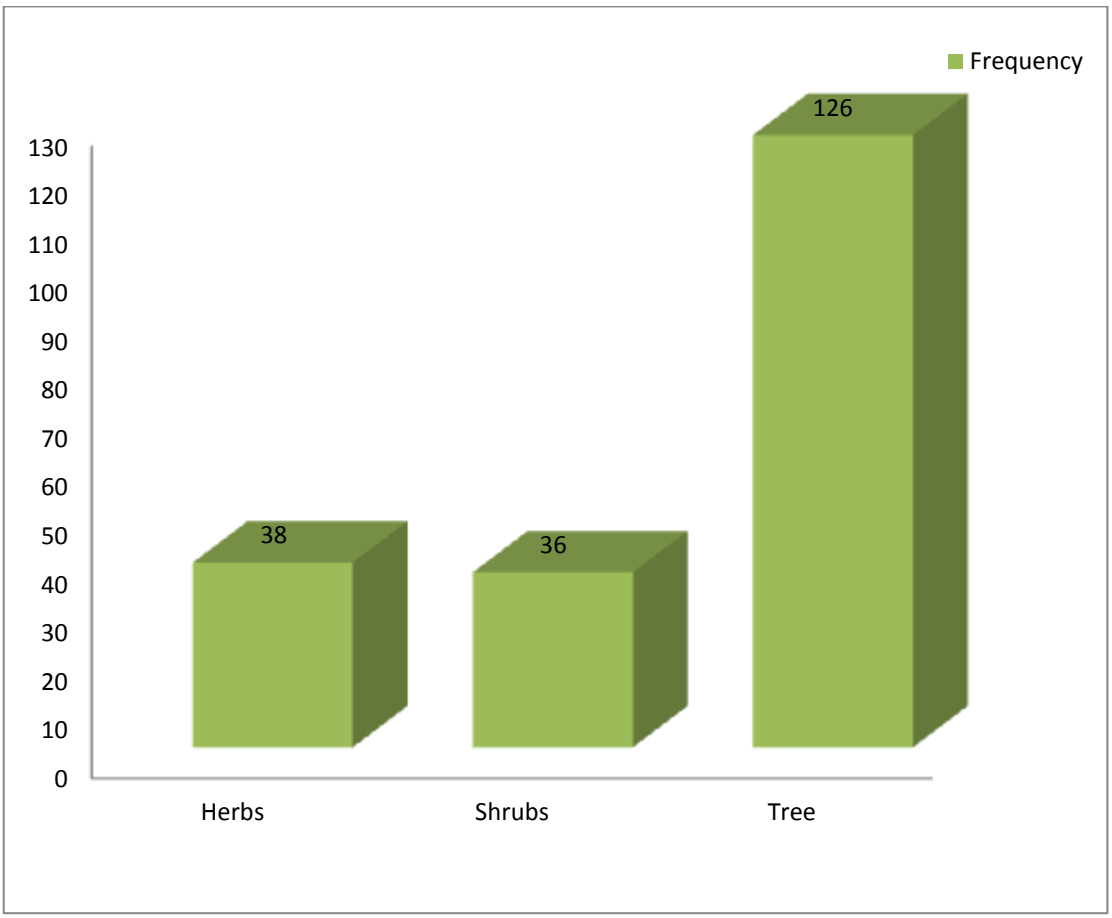

Figure 2: Distribution of plants types commonly used as medicine in Abeokuta, Ogun State.

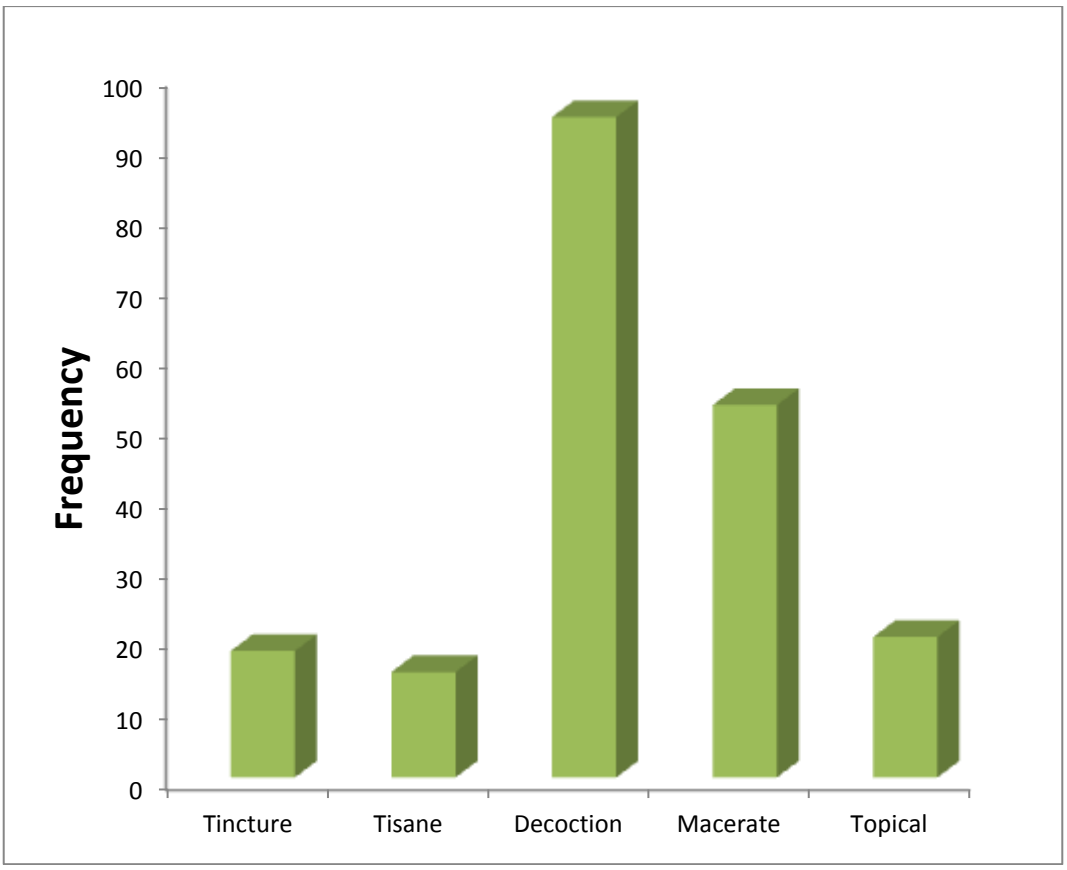

Figure 3: Frequency distribution of type of preparation commonly used as medicine in Abeokuta, Ogun State.

Reference to this paper should be made as follows: Afuape, A.O. (2018), A Survey and Identification of Some Forest Plants used Against Bacterial and Fungal Diseases in Abeokuta Metropolis, Ogun State, Nigeria. *J. of Biological Science and Bioconservation,* Vol. 10, No. 3, Pp. 9-54