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PLANTS TRADITIONALLY USED IN TREATING MALARIA, TYPHOID FEVER AND RELATED COMPLICATIONS IN SOUTH-WESTERN NIGERIA

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Abstract:

This research study was carried out to examined medicinal plant species that is used to treat malaria and typhoid fever and related complications in southwestern Nigeria. This research seek to provide a wider database on the utilization of forest plant parts especially leaves in indigenous healthcare, provide information on parts of the plant species used. The study area was divided into two compartments for the purpose of this research work, undisturbed forest an Data was collected using field surveys and visiting traditional medicine homes for parts the used for the treatment of malaria and typhoid fever. Field trips were embarked upon for three months from July to September 2020 for medicinal plant species identification. The researchers were accompanied by a field assistant who can identify the plant species in local languages.. The computer PAST Model version 3 was used to analyze plant species diversity indices. The result obtained from the study shown that the study area is rich in plant species that are used to treat malaria and typhoid fever in southwest Nigeria. In, all a total of 110 plant species were belonging to 51 families were enumerated in the study area. The family Rubiaceae has highest number of plant species of eight (8) and this followed by Malvaceae with five (5) plant species. The following parts of the plant were used Leaves, barks, ,roots, flowers, fruits and seeds The result of the diversity index indicates that it was higher in the A 4.591 than B 4.469

Keywords: Plants, traditional medicine, World Health Organization, health care

INTRODUCTION

Plants are usually the main component of traditional medicine (World Health Organization, 2003). With about 80% of the world's inhabitants relying mainly on traditional medicines for his or her primary health care, the normal practice continues to play an important role in health care (Rokaya, et al, 2014). Traditional medicine may be a principal sort of health look after many populations, particularly in low- and middle-income countries where traditional healers are appealing since they share a standard perspective with their clients, and make use of data , beliefs, and practices indigenous to the local culture and also for its cost implication, the affordability of most traditional medicines makes all of them the more attractive at a time of soaring health-care costs (WHO, 2013). this type of health care has continued to realize attention as a crucial means of health care coverage globally, (Narajo, 2005). Malaria fever is one among the tropical diseases of socio-economic importance to which man are trying to find an answer for an extended time. it's the foremost prevalent of the tropical diseases identified as a threat to quite 40% of the world's population with about 200 to 450 million. Thus this research study seeks to document plant species wont to treat malaria, typhoid and therefore the associated complications in southwestern Nigeria (Muriuki 2006, Adekunle, 2008). In Asian and African counties alternative medicinal herbs and plant species are widely accepted by the population, hence sustainable development might be developed from the utilization of untamed plants that are wont to treat malaria and typhoid (Deka,*et, al,* 2015). This study therefore aimed toward obtaining and identifying plants traditionally utilized in the treatment of malaria, typhoid in southwestern Nigeria with the hope that potential sources of treatments are often unearthed from medicinal plants. Malaria, typhoid with associated complications are the foremost prevalent diseases in these areas.Thus,this research seek to provide a wider database on the utilization of forest plant parts especially leaves in indigenous healthcare.

MATERIALS AND METHOD

Study Area

The study was carried selected areas in southwestern Nigeria. These are Okomu National Park, Old Oyo National Park, Idanre Forest Reserve, and Gili-gili Forest Reserve. It lies between latitude 60 21`N and longitude 50 13` E (NEA, 2013). The park is located in Ovia Southwest local government, Edo State, Nigeria and has four ranges which are; Julius creek range, the Iguowan range, the Arakwan range, and the Babui creek range (Ikemeh,2009) Idanre forest reserve has a total land area of 527.1 km2, although official compartment maps estimate an area of 540.45 km2 with coordinates of 6°51′28″N 5°06′20″E (Okosodo *et al*, 2016). Gili- gili forest reserve was instituted in 1935. Located on Lat. 50 551and 60 090N and Long. 50 161& 50 271E; is located in Ovia North-East Local Government Area of Edo State, Nigeria. The reserve covers an area of 365 Km2 that ranged from water swamp forest to tropical rain forest (Mengistu, Salami 2007). Old Oyo National Park (OONP) lies between longitudes 8015l and 90E and latitudes 30451 and 4020lN, and has a total land mass of 2,512km2 with the administrative office located along Iseyin - Isokun road, Oyo. The location placed the park at a vantage position of abundance land area as well as diverse wildlife and cultural/historical setting. The entire park is in the southern guinea savanna with the vegetation classified into four- types (Isichei (1995).

The southwestern Nigeria environment comprises of the lowland rainforest, stretching from the coast to about 50 km inland in it western boundary near the Dahomey Gap, to about 150 km inland around the region of the Kukuruku hills, and further stretching to the western bank of the Niger River as it was the eastern boundary. Rainfall is usually between 1,500- 2,500 mm and capable of sustaining the rainforest environment under natural conditions, distributed over an 8 – 9 month period (March – October/November) and depending largely on the distance from the coast. In the times past, vegetation in the zone falls within the lowland rainforest (Ogunjemite and Oates 2008). However, the present physiognomic component of the environment, particularly in the region of Kukuruku Hills, is mainly that of forest/savanna mosaic. The southern parts still have large, continuous patches of reserved forests that had been variously degraded as a result of timber exploitation and encroachment for farming. The impacts of human activities have contributed seriously to the degraded value of the forest environment.

Data collection

The study was carried in two Naional Parks and Two forest reserve in southwestern Nigeia. Two compartments was randomly slected in each study site and it was categorized A and B was for purpose of this research study**.** Data was collected using field surveys and visiting traditional medicine homes for parts used for the treatment of malaria and typhoid fever (Igbarese and Ogbole 2018). Field trips were embarked upon for three months from July to September 2020 for medicinal plant species identification. The researchers were accompanied by a field assistant who can identify the plant species in local languages. Six popular and highly patronized traditional healing homes across the three villages surrounding the study areas were visited.Two This was followed by direct observation and collections of herbal plants from the wild. The plants collected were identified by their vernacular names and their scientific equivalent found and documented. Identification of herbs as well as their uses was done with the aid of a book of trees of Nigeria (Gbele, *et a*l,2008) while inventory of available herbs were recorded. Literature on medicinal plants was searched to back up the claims by the traditional practitioners. In addition, parts of medicinal plants not readily identifiable were taken to the herbarium at the Department of Forestry and Wood

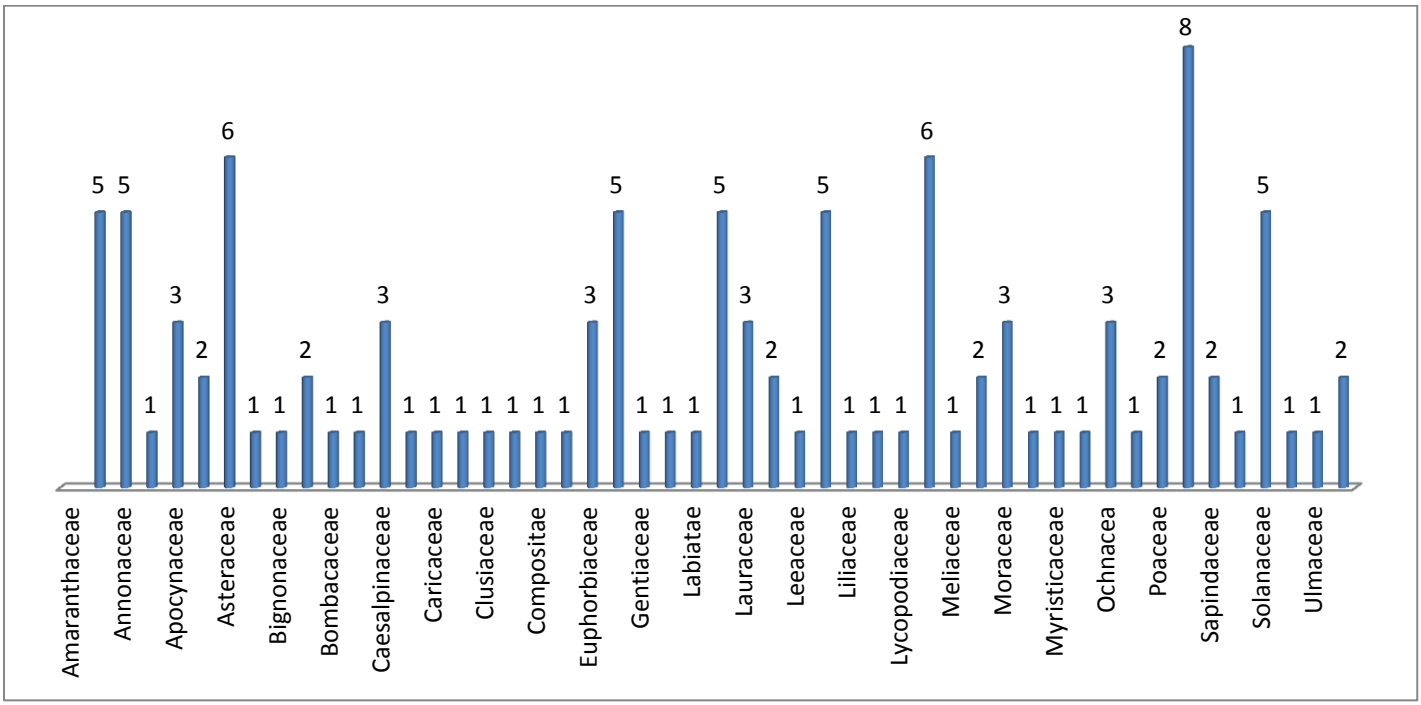
technology, Federal University of Technology Akure for proper identification. Plant parts mostly leaves were put in press for proper preservation.

Statistical Analysis

Data obtained from the field survey were entered into excel (version 15) spread sheet prior to both descriptive (tables, frequency and percentage frequency, graph, pie and bar charts). The computer PAST Model version 3 was used to analyze plant species diversity indices

RESULTS

From the result obtained from the research study it indicates that south west is rich in plant species used for the treatment of malaria and typhoid fever and diseases associated with it. In, all a total of 110 plant species were belonging to 51 families were enumerated in the study area. The family Rubiaceae has highest number of plant species of eight (8) and this followed by Malvaceae with five (5) plant species Figure 2. The result shown that all the parts of the plant species are utilized, leaves, barks, flowers, roots, seeds, fruits. In all leaves was widely used at of the one hundred and ten (110) plants recorded the leaves of eighty nine plants was for the treatment of malaria and typhoid fever, this is followed by the barks of the plants species Figure 3. The result of the plant type indicates that trees 67% were higher than shrubs 27% and annual plant species 6% Figure 4.The result of the diversity index indicates that it was higher in the A 4.591 than B 4.469 Table 1 The checklist of medicinal plant species enumerated in the study area Table 2



Figure, The family composition of the medicinal plant species in the study area

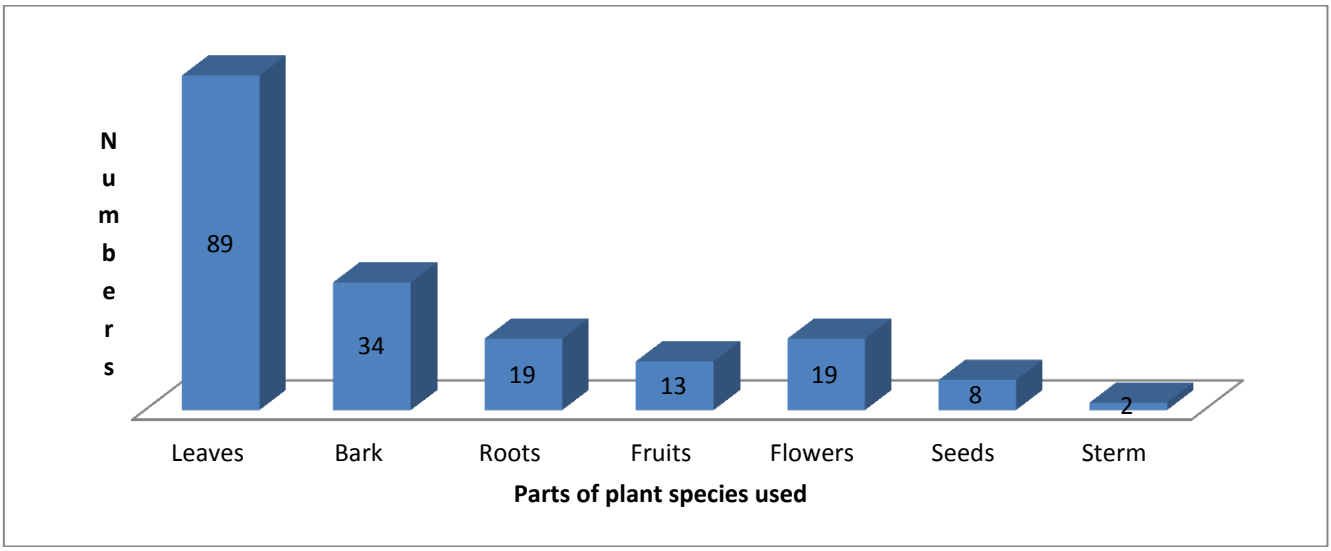


Figure 3, The parts of plant species used

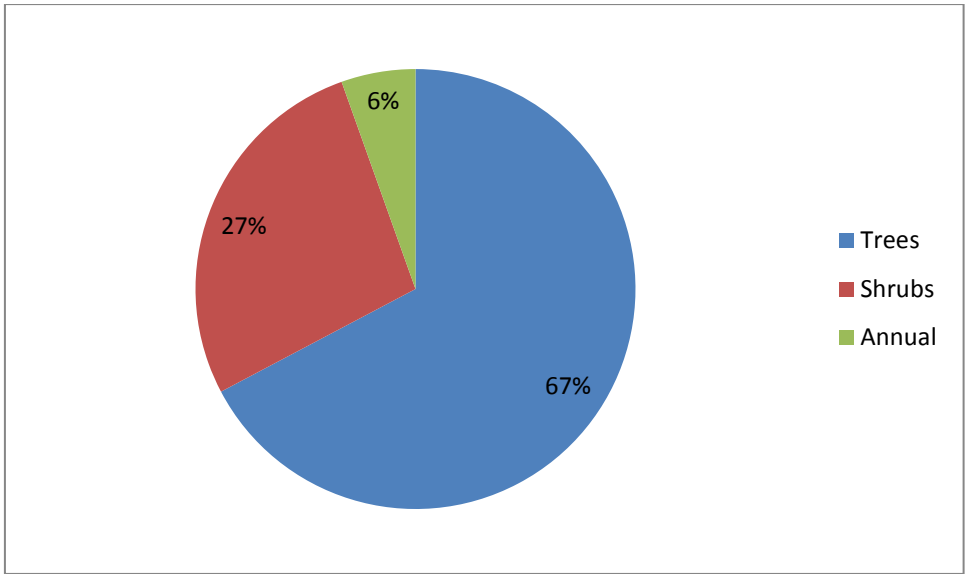


Figure 4, Plant Types recorded as medicinal in the study area

Table1, Diversity index of the plant species in the study area

Diversity index	Dry season	Lower	Upper	Wet season	Lower	Upper
Taxa_S	110	108	110	110	98	109
Individuals	192	192	192	155	155	155
Dominance_D	0.01427	0.0115	0.01373	0.01145	0.01136	0.01494
Shannon_H	4.469	4.502	4.58	4.591	4.426	4.583
Evenness_e^H/S	0.7937	0.8255	0.8873	0.8967	0.8414	0.9102
Brillouin	3.824	3.85	3.913	3.826	3.722	3.824
Menhinick	7.939	7.794	7.939	8.835	7.872	8.755
Margalef	20.73	20.35	20.73	21.61	19.23	21.41
Equitability_J	0.9509	0.9592	0.9746	0.9768	0.9626	0.9798

Table 2, Checklist of medicinal plant species in the study area

Name of Plant Species	Family	Part used	Medicinal uses
Acanthospermus hispidum	Lauraceae	leaves	Malaria, Typhoid and yellow fever
Adenia cissampeloides	Lauraceae	leaves, bark ,root	Appetizer, general weakness, jaundice
Adenia venenata	Passifloraceae	leaves and bark	Malaria, jaundice, anthelmintics,
Aframomum melegueta	Zingiberaceae	seeds, leaves	Measles, small pox and typhoid fever
Afzelia africana	Leguminosae	Leaves	Malaria
Ageratum conyzoides	Asteraceae	Leaves	Malaria
Albizia ferruginea	Leguminosae	leaves and bark	Malaria and Typhoid fever
Alchornea cordifolia	Euphorbiaceae	Leaves	Malaria and Typhoid fever
Alstonia boonei	Apocynaceae	leaves and bark	Malaria and Typhoid fever
Anacardium occidentale	Anacardiaceae	leaves and bark	Malaria and Typhoid fever
Ananas comosus	Anacardiaceae	Leaves, bark ,fruits	malaria
Annona muricata	Annonaceae	Leaves fruit	Anemia, dysentery
Annona sanegalensis	Annonaceae	Leaves, bark ,fruits	Typhoid fever, cough,
Anthocleista djalonensis	Gentiaceae	Barks	Purgative malaria and typhoid fever
Anthocleista vogelli	Loganiaceae	Barks and Leaves	Vomiting, antidote for snake bite
Anthonotha macrophylla	Leguminosae	leaves, bark, roots	Appetizer, jaundice ,malaria
Asparagus africana	Liliaceae	whole plant	antimicrobial, kidney diseases
Aspilia africana	Asteraceae	Leaves	Malaria and Typhoid fever

Bambusa vulgaris	Bambusaseae	Leaves	Malaria
Bauhinia simplicifolia	Fabaceae	eaves, fruits	Antimicrobials, malaria typhoid fever
Blighia sapida	Sapindaceae	Leaves, fruits, bark	Malaria
Bridelia ferruginea	Euphorbiaceae	Leaves, bark, roots	mouth wash, Malaria, Typhoid fever
Burkea africana	Fabaceae	Bark, twigs	Headache
Cajanus cajan	Fabaceae	Leaves, seeds	mouth wash, Malaria, Typhoid fever
Canna indica	Cannaceae	leaves	Asthma, malaria
Capsicum frutescens	Solanaceae	Laves, Fruits	Malaria
Carica papaya	Caricaceae	Leaves, seeds, fruits	Malaria, Typhoid fever and gonorrhea
Cassia sieberiana	Asteraceae	Leaves	Malaria
Ceasalpinia bonduc	Ceasalpiniaceae	Leaves, flowers root	Dysentery, malaria, typhoid fever
Ceiba pentandra	Bombacaceae	Leaves, roots	stomach disorders, malaria, Typhoid fever
Celosia argenta	Amaranthaceae	Leaves, Tubers	Malaria, anemia, poison antidote
Chorchoruso litorus	Bixaceae	Leaves, roots	Malaria, Typhoid fever and kidney diseases
Chromolaena odorata	Leguminosae	Leaves	Malaria
Chrysophyllum albidum	Sapotaceae	Leaves, bark, seeds	Malaria, Typhoid fever
Cinnamomum zeyianiam	Lauraceae	Leaves, bark, oil	Nausea, typhoid fever, vomiting,
Citrus aurantifolia	Rutaceae	Leaves, Fruits, roots	Malaria, typhoid fever jaundice
Citrus limon	Rutaceae	Leaves, fruits roots	Malaria, Colds, cough
Citrus medica	Rutaceae	Leaves, fruits, roots	Malaria and Typhoid fever
Clappertonia facifolia	Malvaceae	Leaves, barks	Dysentery, malaria, typhoid fever
Cochlospermum tinctorium	Bixaceae	Leaves	Malaria
Cola latertia	Sterculiceae	Leaves	Malaria
Combretum reticulatum	Combretaceae	Leaves	Malaria
Curcuma longa	Zingiberaceae	Tubers, roots	Malaria, Typhoid fever
Cymbopogon citratus	Poaceae	Leaves	Malaria
Daucus carota	Apiacea	Leaves	Malaria
Diospyros mespiliformis	Ebeneceae	Leaves	Malaria, Typhoid fever
Emilia sonchifolia	Asteraceae	Leaves	Malaria
Euphorbia hirta	Euphorbiaceae	Leaves	Malaria, jaundice
Ficus elegans	Moraceae	Leaves	Malaria, stomach disorders
Ficus exasperata	Moraceae	Leaves	Malaria, Blood tonic
Funtumia africana	Apocynaceae	Leaves, roots stem,	Malaria, constipation
Garcinia kola	Clusiaceae	Leaves, Fruits, roots	Malaria, cough, asthma
Gongronema latifolia	Asclepiadaceae	Leaves, barks	Malaria, Typhoid fever,
Gossypium barbadens	Malvaceae	Leaves, roots	Malaria
Gossypium hirsutum	Malvaceae	leaves, roots	Malaria
Haematostaphis barteri	Anacardiaceae	leaves, barks	Malaria, Typhoid fever
Harungana madagascariensi	Hypericaceae	Leaves roots, barks	Typhoid fever cough
Heeria insignis	Anacardiaceae	Leaves, bark, roots	Malaria, Typhoid fever, blood tonic
Heliotropicum indicum	Boraginaceae	Leaves, barks	Malaria, Typhoid
Hexalobus crispiflorus	Annonaceae	Leaves	Malaria
Hibiscus rosasinensis	Malvacea e	Leaves	Malaria, dysentery,
Hyptis suaveolens	Labiatae	Laves, roots	Malaria, Cough
Khaya senegalensis	Meliaceae	Barks	Typhoid fever
Khaya grandifoliola	Meliaceae	Barks	Typhoid fever, cough

Leea guineensis	Leeaceae	Leaves	Malaria
Leonotis nepetifolia	Lamiaceae	Leaves	Malaria
Leucas martinicensis	Lamiaceae	Laves, barks	Malaria, Typhoid fever,
Lophira alata	Ochnaceae	Leaves, barks, seed, roots	Malaria, Typhoid fever, jaundice
Lycopodium cernuum	Lycopodiaceae	Leaves	Malaria, jaundice in New born baby
Mangifera indica	Anacardaceae	Leaves, bark	Malaria
Melicia excelsa	Moraceae	leaves, barks	Malaria, dysentery
Millettia thonningii	Leguminaceae	Leaves	Malaria
Mitragyna inermis	Rubiaceae	Leaves	Malaria
Monadora myristica	Annonaceae	Leaves, Seeds	Malaria, typhoid fever
Morinda lucida	Rubiaceae	Leaves	malaria
Morus alba	Lecythidaceae	Leaves	Malaria, piles
Musa paradisiaca	Musaceae	fruits, flowers	Malaria, Typhoid fever
Musa sapientum	Asteraceae	fruits, flowers	Malaria, Typhoid fever
Napoleonaea imperialis	Lecythidaceae	Leaves, barks ,roots	Malaria, Yellow fever, diabetes
Nauclea latifolia	Rubiacea	Leaves	Typhoid fever
Newbouldia laevis	Bignonaceae	Leaves	Blood tonic, dysentery
Nicotiana tobacum	Solanaceae	Leaves,	Malaria
Nymphaea lotus	Nymphaeaceae	whole plant	Malaria, vomiting
Ocimum basilicum	Lamiaceae	Leaves	Malaria, stomach disorders
Ocimum gratissimum	Lamiaceae	Leaves	Malaria
Ouratea flava	Ochnacea	Leaves, Fruits	Malaria, Laxative
Oxalis corniculata	Ochnacea	Leaves	Typhoid fever, boils
Parkia biglobosa	Fabaceae	Leaves, barks, seed, roots	Typhoid fever blood tonic, diabetes
Parquetina nigrescens	Lamiaceae	Leaves, barks	Malaria, Blood tonic, cough
Paullinia pinnata	Sapindaceae	Leaves	Malaria
Pennisetum purpureum	Poaceae	Leaves	Malaria,
Pentaclethra macrophylla	Fabaceae	Leaves, barks, latex	Typhoid fever, cough, gonorrhoea
Pergularia daemi	Asclepiadaceae	Leaves	Malaria
Physalis angulata	Solanaceae	Leaves	Malaria
Piliostigma thonningii	Caesalpinaceae	Leaves	Malaria
Pseudocedrella kotschyi	Rubiacea	Leaves, barks	Typhoid fever, vomiting
Pycanthus angolensis	Myristicaceae	Laves, barks	Malaria typhoid fever
Rauvolfia vomitoria	Apocynaceae	Leaves, roots	Constipation, Typhoid fever,
Sarcocephalus latifolius	Rubiaceae	Leaves	Malaria
Senna podocarpa	Caesalpiniaceae	Leaves	Malaria
Senna siamea	Caesalpiniaceae	Leaves	Malaria
Sida acuta	Malvaceae	Leaves	Malaria
Solanum lycopersicon	Solanaceae	Leaves, fruits	Malaria
Solanum nigrum	Solanaceae	Leaves	Malaria
Sphenocentrum jollyanum	Menispermaceae	Leaves	Malaria
Synclisia scabrida	Menispermacea e	Leaves, barks	Malaria, Yellow fever,
Tithonia diversifolia	Compositae	Leaves	Malaria
Trema orientalis	Ulmaceae	Leaves, barks	Typhoid fever
Vernonia amygdalina	Asteraceae	Leaves, stem	Malaria, Typhoid fever
Xylopia aethiopica	Annonaceae	Seeds	Malaria

DISCUSSION

The result obtained indicates that the study area is rich in plant species that are used to treat malaria and typhoid fever and the associated diseases in southwest Nigeria. In all, a total of one hundred and ten (110) plant species belonging to 51 families was enumerated in the study area. This finding is consistent with following studies who carried out ethnobotanical surveys in Nigeria such as (Sodipo, and Wannang, 2015) who reported the use of forest plants to treat some tropical diseases, Aguoru and Ogaba, (2010) reported that Bambusa vulgaris, Mangifera indica, Ananas comosus, Carica papaya, Ocimum gratissimum, Azadirachta indica, Psidium guajava, Citrus aurantifolia, and Moringa oleifera were used in the treatment of typhoid amongst the Idoma people of Benue state. Halimat et al., (2017) also reported that Mangifera indica, Alstonia boonei, Ananas comosus, Carica papaya, Ocimum gratissimum, Azadirachta indica, Psidium guajava, Sarcocephalus latifolius, Citrus aurantifolia, Citrus paradisi, and Zingiber officinale were used in the treatment of typhoid in Minna, Niger State. Another study carried out by Sodipo and Wannang, (2015) in Jere Local Government Area of Borno State showed that Azadirachta indica and Citrus aurantifolia were also mentioned.

The result has also shown that leaves, the bark of the trees were mostly used. The leaves of these plants were used singly or in combination with other herbal materials in the fresh or dried forms which are either in the combination of other herbal roots, flowers, and gum of other plant species. Leaves also act as reservoirs for the products of photosynthesis or exudates which contain more bioactive secondary metabolites for protection against devourers (Herbivores). Some of these compounds may be of medicinal value to the human body (**Bodeker, *et al*,** 2005). Additionally, the use of leaves is less dangerous to the existence of plant species as compared to the use of underground parts (roots, stem, bark), or the use of entire plants (Phua, 2009) Most of the plant parts used was found to be in the dried state. These were the main methods used in the preservation of the plant materials . As water is a fundamental requirement in microbial growth (Tabuti, 2006), the dried plant materials are better protected from microorganisms infestations. However, if the active compounds in the plants are volatile compounds then the efficacy of the herbal remedies would be lost or reduced in the dried plant materials mode of application is mostly oral by drinking the extracts or concoctions or vapor bathing. However, the dosage levels and the quantities harvested at a time are not measured.. The treatment could be repeated till the person be treated is healed. This finding is in agreement with Anoka (2012) who reported that the medicinal uses are varied and the plant species parts that are used range from leaves, roots, stem, bark to fruits only, or a combination of two or more in a species or with those of other species Acharya, (2008) reported that in India a decoction of or infusion medicinal herbs is used to treat stomach ailments such as diarrhea, dysentery and intestinal colic with flatulence. Ochiai, (2011) reported that in Brazil a decoction of leaves has been found to be useful in the treatment of ovarian inflammation, amenorrhea, rheumatism, and diarrhea, an infusion of the entire plant has be found to give relief from intestinal pains, anoxia, and arthritis

The results show that various plant types were recorded, these are trees, shrubs, and annuals. This is consistent with Adekunle, (2008) reported various plant life forms of trees, shrubs, and herbs in Omo forest reserve southwestern Nigeria. Most of the medicinal plant species recorded in this study have been shown to be biologically active against various illnesses (Abena et al., 2007); (Oreagba,*et a*l 2011); (Sofowora, 2003); (Okoli *et al*., 2007); (Oshikoya, et al 2008); (Iwu, 2003). The conservation of these important plants and the knowledge of traditional medicine run in parallel, they are important and interrelated as many medicinal plants are under threat due to over-collection and destructive harvesting practices.

CONCLUSION AND RECOMMENDATION

The need to search for or effective drugs to treat malaria cannot be over-emphasized. With the widespread of resistant malaria to orthodox variant across Asia and Africa countries and Nigeria in particular, there is an urgent need to study the most commonly used remedies and plants implicated in their formulation to ascertain their capacity to reduce parasite densities and symptoms of malaria. This study will documented a diversity of plants species used in the treatment of malaria in Southwestern Nigeria. Health and wellness tourism has grown throughout the world and includes the consumption of much traditional medicine. Owing to its medicinal history, India and Nigeria has significant potential for promoting traditional medicine as a consumer product for local consumption, as an export product, and as a tourism resource. It is clearly one of the most important elements of these countries intangible heritagescape that is worthy of additional consideration by tourism developers. Based on this research study many local residents can establish herbal gardens that will enhanced a sense of familiarity with local biodiversity and its conservation, especially herbal plants. The traditional use of herbal health remedies will provides significant nutritional, economic, and ecological benefits for rural communities through tourism. Environmental and management problems are imminent such as deforestation barking of trees, defoliation of plant leaves, and overexploitation, hence efforts should be made to educate the residents on the sustainable harvest. Efforts management plans should be set up to train local residents on the need to cultivate most of these plants around their homes and farms to reduce damages done to the forest reserve The government should set up a mechanism to integrate alternate medicine which is the use of wild herbs with orthodox medicine. This will improve the sustainable use of these wild plants and create an efficient method of collecting extract from the plant species. It is also common knowledge that the safety of most herbal products is further compromised by lack of suitable quality controls, inadequate labeling, and the absence of appropriate patient information

REFERENCES

1. Acharya, M., K. Deepak, A. Shrivastava, 2008. Indigenous herbal Medicine: Tribal formulations and Traditional herbal practices.Aavishkarpublishers, pp: 440.
2. **Adekunle, M.F**. (2008).Survey of nontimber forest products (NTFPS) and their uses in Omo forest reserve.Ogun state, Nigeria. Master of Forestry (MF) thesis, Department of forestry and Wildlife Management, University of Agriculture, Abeokuta, Nigeria. (Unpublished) 158p
3. Anoka AN. Herbal medicine used in the treatment of Malaria: Vernonia amygdalina: An overview of evidence and pharmacology. In: Acree B, editor. Toxicity and Drug Testing.Croatia: InTech; 2012
4. **Aguoru,** C. and Ogaba, J. (2010). Ethonobotanical Survey of Anti-Typhoid Plants Amongst the Idoma People of Nigeria. International Science Research Journal, 2: 34-40
5. **Bodeker** C., Bodeker G., Ong C. K., Grundy C. K., Burford G., Shein K. (2005). WHO Global Atlas of Traditional, Complementary and Alternative Medicine. Geneva, Switzerland: World Health Organization
6. Deka, B. P., Borgohain, R., & Bharali, D. (2015). Prospects of herbal gardens as new vistas of medical tourism in North East India. Annals of Pharmacy and Pharmaceutical Sciences, 6(1/2), 46–49.
7. Gbile ZO, Ola-Adams BA, Soladoye MO. Endangered Species of the Nigerian Flora. Nigerian Journal of Forestry 1978; 8(1):14-20.
8. **Halimat,** A., Abdulkarim, A., Najma, I., Audu, O.I. and Mohammad, C.D. (2017). An Ethno botanical Survey of Medicinal Plants Used for the Treatment of Typhoid Fever in Minna, Niger State. Journal of Natural Sciences Research 7(8)
9. **Igberaese** and Ogbole ethno botanical survey of plants used in the treatment of typhoid and its complication(s) in esan north east local government area, Uromi, Edo State. Nig.J.Pharm. Res. 2018, 14 (2):175-188
10. Ikemeh (2009) Status Survey of the Idanre Forest Reserve: A February 2009 Survey. Report to the A.G. Leventis Foundation, Liechtenste in, the Nigerian Conservation Foundation, Lagos, and the Ondo State Government, Nigeria.
11. Isichei (1995) Omo Biosphere Reserve, Current Status, Utilization of Biological Resources and Sustainable Management (Nigeria) Working Papers of the South-South Cooperation Programme on Environmentally Sound Socio-Economic Development in the Humid Tropics. UNESCO, Paris
12. Iwu MM (1993). Handbook of African medicinal plants. Boca Raton. CRC Press pp. 178-179.
13. Mengistu, Salami (2007) Application of remote sensing and GIS inland use/land cover mapping and change
14. detection in a part of south western Nigeria. African Journal of Environmental Science and Technology 1: 099-109.
15. **Muriuki, J**. (2006). Forests as pharmacopoeia: identifying new plant based treatments for malaria. Unasylva 224 vol.57, 2006:24-25.'
16. Nigerian Environmental Analysis (2013) Biodiversity and Sustainable Forestry (BIOFOR) Indefinite Quantity Contract (IQC). (USAID BIOFOR, London and Abuja
17. Narajo, T. K. (1995)."The Urgent need for the study of Medicinal Plant", in.Schultes, R. E and Reis S
18. Von (eds)Ethnobotany: Evaluation of A Discipline. London:Chapman and Hall.
19. Ogunjemite BG, Afolayan TA, Agbelusi EA (2005) Habitat Structure of Chimpanzee Community in Ise
20. Forest Reserve, Ekiti State, South-western Nigeria, Afr. J. Ecol 43: 396-399
21. Ochiai, R.L., C.J. Acosta, M.C. Danovaro-Holliday, B. Dong, S.K. Bhattacharya, M.D. Agtini, A.B. Zulfiqar, D.G Canh,. M. Ali, S. Seonghye, J. Wain, P. Anne-Laure, J. Farrar, R. Abu-Elyazeed, T. Pang, C.M. Galindo, S.Lorenz von and J.D. Clemens, 2011. A study of typhoid fever in five Asian countries: disease burden and implications for controls. Bulletin of the World Health Organization, 89(7): 469-544
22. Oreagba IA, Oshikoya KA, Amachree M. Herbal medicine use among residents in Lagos,
23. Nigeria. BMC Complimentary and Alternative Medicines. 2011;**11**:117-124. DOI: 10.1186/
24. 1472-6822-11-117
25. **Okosodo EF**, Orimaye J. O., and Ogunyemi O. O. Habitat effects on avian species abundance and diversity in idanre forest reserve south western nigeria. International Journal of Plant, Animal and Environmental Sciences Volume-6, Issue-3, Apr-Jun-2016 Pp 1to 18
26. Okoli RI, Aigbe O, Ohaju-Obodo JO, Mensah JK. Medicinal herbs used for managing some common ailments among Esan people of Edo State, Nigeria. Pak.J. Nutr 2007;6(5):490-496
27. Oshikoya KA, Senbanjo IO, Njokanma OF, Soipe A. Use of complementary and alternative medicines for children with chronic health conditions in Lagos, Nigeria. BMC Complement Altern Med 2008;8:66. doi:10.1186/1472- 6882-8-66..
28. Phua DH, Zosel A, Heard K. Dietary supplements and herbal medicine toxicities—When to anticipate them and how to manage them. International Journal of Emerging Medicine. 2009;**2**(2):69-76
29. **Rokaya**, M.B., Uprety, Y., Poudel, R.C., Timsina, B., Münzbergová, Z., Asselin, H., Tiwari, A., Shrestha, S.S. and Sigdel, S.R. (2014). Traditional uses of medicinal plants in gastrointestinal disorders in Nepal. Journal of Ethnopharmacology, 158: 221-229
30. Soladoye MO, Chukwuma EC, Owa FP. An 'Avalanche' of Plant Species for the Traditional cure of Diabetemellitus in South-Western Nigeria. Journal of Natural Product and Plant Resources 2012; 2(1):60-72

31. Sofowora EA. Medicinal Plants and Traditional Medicine in Africa. 2nd ed. Ibadan,
32. Nigeria: John Wiley and Sons Ltd, Spectrum Books; 1993. pp. 55-62
33. **Sodipo, O**. and Wannang, N. (2015). Ethno pharmacological survey of plants used by trado-medical practitioners (TMPs) in the treatment of typhoid fever in Gomari Airport Ward, Jere local government area, Borno State, Nigeria. American Journal of Ethno medicine, 2
34. JZRS. Herbal medicine used in the treatment of malaria in Budiope County,
35. Tabuti Uganda: A case study of Budiope County. Journal of Ethnopharmacology. 2006;**116**:33-
36. 42. The Garden Club of America/Makerere University Anne S. Catham Fellowship in
37. Medicinal Botany, Makerere University
38. **WHO (2013**). WHO Traditional Medicine Strategy 2014–2023. Zlatković, B.K., Bogosavljević, S.S., Radivojević, A.R. and Pavlović, M.A. (2014). Traditional use of the native medicinal plant resource of Mt. Rtanj (Eastern Serbia): Ethnobotanical evaluation and comparison. Journal of Ethnopharmacology, 151: 704-713